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Paragon Deployment Manager™

User Manual

Contents

Introduction

Network facilities are becoming increasingly crucial in the present day IT environment. Traditionally communication used to be established between individual hosts, i.e. sender (or source) and receiver. However, such recent phenomena as IP video conferencing, streaming media, etc. gave rise to a real problem of efficient one-to-many communication means. Just imagine how much network traffic would be needed to conduct an IP video conferencing among a dozen of participants. Actually the current Internet technology simply cannot keep up. That is where Multicast comes into scene. It is a specially developed technique providing data delivery from one location to many others without any unnecessary packet duplication, thus minimizing server load whereas maximizing the network performance. With that technique only one packet is sent from a source and is replicated as needed in the network to reach as many end users as necessary. Obvious benefits it offers may also be successfully applied to the problem of the system deployment technological chain.

Paragon Deployment Manager™ is a powerful multifunctional solution for system deployment, recovery and cloning. Besides possibility to make complete, reliable backups of the system and critical data, it enables, by employing state-of-the-art network technologies, to automatically deploy practically unlimited number of computers at a time as easy and quickly as never before.

Paragon Deployment Manager provides a user-friendly interface with highly customizable automation and an abundant set of post imaging configuration options, i.e. everything to make a job of a system administrator as easy and convenient as possible. Moreover, minimum efforts are required for integration with Microsoft® Sysprep for a complete out of the box experience.

With our solution you will dramatically reduce deployment time, resource requirements and costs. The key features of the program are listed in the special chapter.

Setting up any operation is accomplished by using practical wizards. Each step of the wizard includes in-depth information in order to allow you to make the right choice. Graphical representations of the data help you to gain a better understanding.

In this manual you will find the answers to many of the technical questions which might arise while using the program.

> **i** **Our company is constantly releasing new versions and updates to its software, that's why images shown in this manual may be different from what you see on your screen.**

What's New in Deployment Manager 11

- New user-friendly interface that is fully compatible with the Windows 8 streamlined, tile-oriented interface
- Instead of Bootable Media Builder, our product now includes Recovery Media Builder (RMB) that:
  - Prepares Linux or WinPE-based bootable environment on a USB thumb drive, in an ISO or PXE image;
  - Doesn't obligatory require Windows Assessment and Deployment Kit (ADK) or Automated Installation Kit (WAIK) on Windows 7 and later platforms;
  - Can build WinPE-based media on Windows XP, Vista, Server 2003 if there's WAIK installed in the system;
  - Allows injecting additional drivers for storage devices, network controllers, USB controllers, or system during setup;
  - Enables to customize boot menu with the option to add custom PSL scripts;

- Enables to automatically execute custom PSL scripts before the deployment process is initiated (drive partitioning operations, etc.);

- Fixes uEFI-based Windows OS to successfully start up on client machines after deployment;

- Enables to set up a network connection with a pre-mounted network share during setup;

- Allows adding any set of files to bootable media;

- Prepares hybrid (both, uEFI and BIOS compatible) 64-bit recovery environment on flash or in an ISO image.

▪ Deploys images containing GPT (GUID Partition Table) hard disks

▪ Supports backup images in the .PBF or .pVHD format. Please note that the current version can work with pVHD images containing entire hard disks only

▪ Includes EFI NVRAM menu fixup for deploying images containing GPT hard disks (available only for x64 target client environment booted in the uEFI mode)

▪ Supports BIOS/uEFI boot mode and MS DHCP settings on PXE Server

▪ The **Check file system integrity after deploy** option has been moved to Post-Config templates

▪ Separate x86 and x64 installation packages. Please note that Recovery Media Builder inside the x86 installation package can only build x86 WinPE or Linux media, while x64 RMB can build x86/x64 Linux and x64 WinPE media.

Key Features

Let us list some of the key features:

▪ User friendly interface. Easily understood icons accompany all functions of the program.

▪ Comprehensive wizards simplify even the most complex operations.

▪ Fast and powerful system imaging and hard disk partitioning with Paragon Hard Disk Manager™.

▪ Support of deployment templates to minimize the system deployment time and costs.

▪ Use of Post-Config options enables to easily customize the client disk layout and set up the required Windows settings (PC name, DNS, display, etc.).

▪ Ready-made Post-Config templates to accomplish the most frequently used operations after deployment.

▪ Adaptive Restore template to successfully recover Windows 2000/XP/Server 2003 as well as Windows Vista/7/8/8.1/Server 2008/2012 to a different hardware configuration.

▪ PXE Server support to remotely boot client computers.

▪ Server-driven mode provides simultaneous deployment of one image to many computers.

▪ Client-driven mode to launch the deployment procedure from the client's side, thus bypassing the central console management. When using one and the same image you can take all advantages of simultaneous deployment as well.

▪ Automatic multisession cyclic deployment for manufacturing purposes.

▪ The system of advanced log facilities (session logs, history logs, current activity logs, etc.) assists you to monitor real-time every action of the program in order to get in-depth information on the deployment procedure.

Installation and Package Contents

This chapter provides information that is needed to perform the correct installation of the program, and in addition, checks if the current installation is working correctly.

Package Contents

Deployment Server:

The installation package for the Deployment Server includes the following components:

- **Hard Disk Manager** to create/restore backup images or carry out partitioning operations, etc.

- **PXE Server** (includes DHCP and TFTP services) to remotely boot client computers

- **Infrastructure Server** to initiate and control the deployment procedure

- **Deployment Console** to set up and manage remote computers

- **Recovery Media Builder** to prepare client bootable media

Target Module:

The Target Module also contains several components. It does not require installation:

- **Server-driven/Client-driven mode** to make remote computers be recognized in the network as targets for deployment purposes

- **Hard Disk Manager** to create/restore backup images or carry out partitioning operations, etc.

- **Network Configurator** to establish a network connection

- **Simple Restore Wizard** to easily get the system back on track again

- **Log Saver** to tackle problems with handling the program by compressing logs to send to the Paragon Support Team

Minimum System Requirements

To use the program on a computer satisfactorily, ensure that it meets the following minimum system requirements:

Deployment Server:

- Operating systems: Windows 2000/XP/Vista/7/8/8.1 and Server 2003/2008/2012 R1/R2 both, 32/64-bit

- Network Interface Card (NIC): 100 Mbps and higher

- Open ports in Firewall for TCP/UDP: from 2017 to N, where N depends on max number of sessions in progress, working simultaneously, PXE support

- Intel Pentium CPU or its equivalent, with 300 MHz processor clock speed

- 512 MB of RAM

- SVGA video adapter and monitor

- Mouse (recommended)

Target Module:

- Network Interface Card (NIC): 100 Mbps and higher

- PXE-enabled NIC (recommended)

- Wake-up on LAN support (recommended)

- Intel Pentium CPU or its equivalent, with 300 MHz processor clock speed

- 256 MB of RAM for the Linux and at least 1 GB for the WinPE target module

Additional requirements:

- To install and run the product the target OS should have Visual Studio C++ 2010 Runtime Library installed (comes with the installation package – you will be prompted to install it, if it's not been found in the system).

ℹ️   **During the installation additional free space (up to 1GB) will be required.**

Installation Procedure

Since the Target Module does not require installation, this operation can only be applied to the Deployment Server. The installation package contains several components, some of which are independent (PXE Server, Infrastructure Server, Deployment Console), i.e. they can be installed separately on different computers.

❗   **To optimize the network performance it is strongly recommended to install the Infrastructure Server on a File Server where master images are kept.**

The installation process consists of the following steps:

ℹ️   **In case there is some previous version of the program installed on the computer, the program will offer the user to uninstall it first.**

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1. Click on the supplied setup file to initiate the installation. First your system will be checked for the presence of Visual Studio C++ 2010 Runtime Library and if not found, you will be prompted to install it (comes with the installation package). Click **OK** to continue.

Status	Requirement
Pending	Visual C++ 10.0 Runtime - x86 10.0.30319.1

OK   Cancel
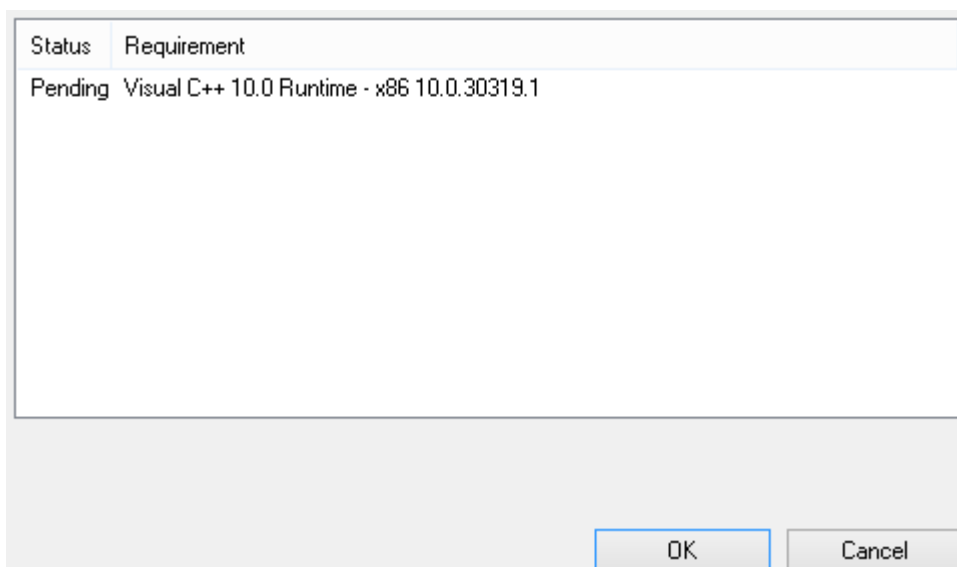
2. The Welcome page will inform that the application is being installed. Click **Next** to continue.

3. Please Read Paragon License Agreement carefully and then select the appropriate option to accept. Otherwise you won't be able to proceed with the installation. By clicking the **Print** button, the license agreement may also be printed out.
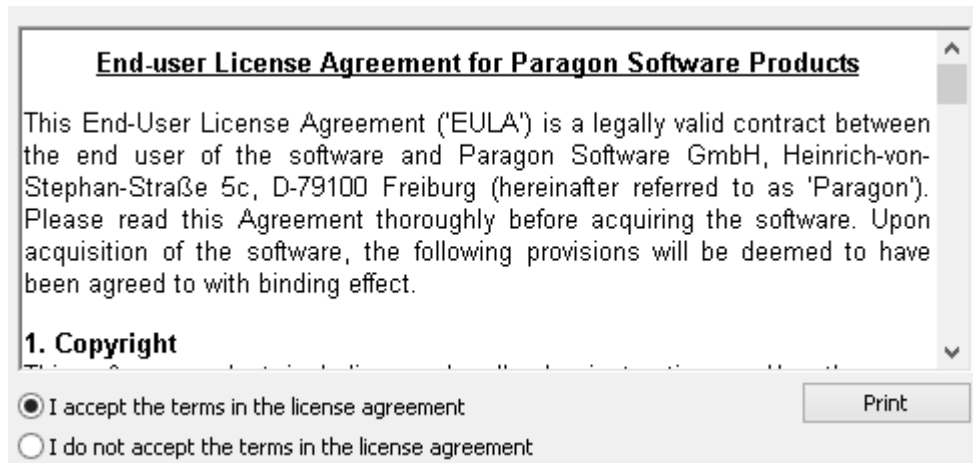
4. The next page enables you to select what components are to be installed and also set an installation folder.
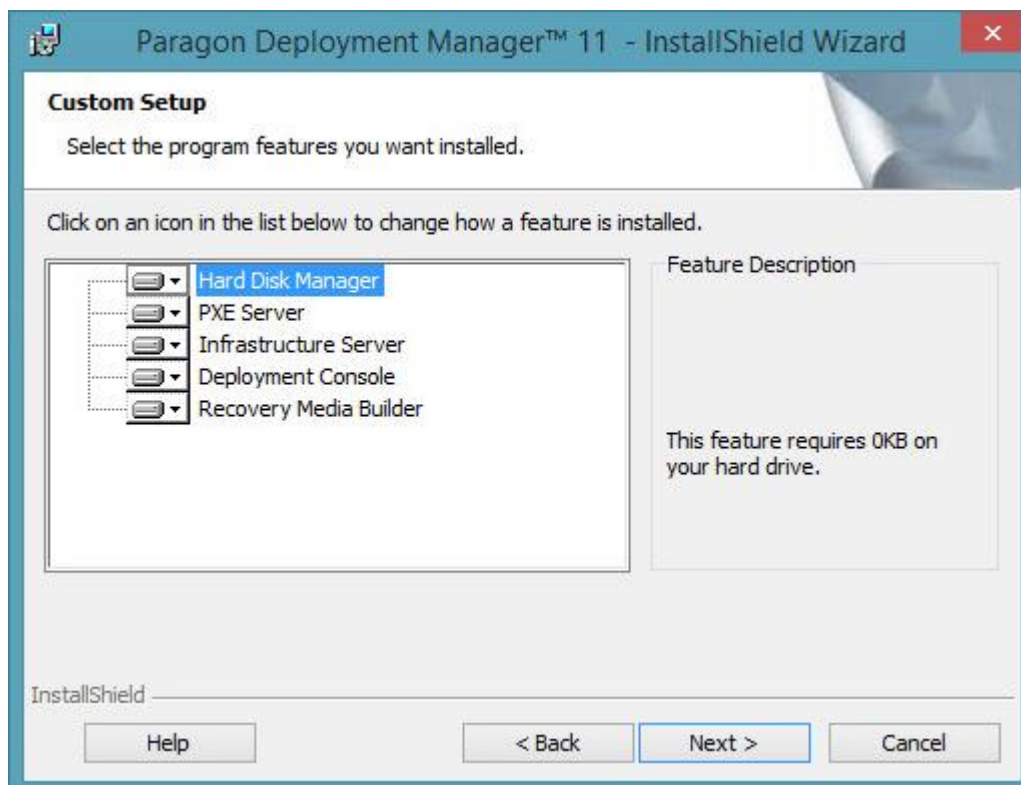
Call the popup menu for the required item (left click of the mouse button on the icon), then select whether to install the component or not. A brief description to the selected feature and approximate disk space needed to install it will be displayed on the right, thus precluding any mistake being made on your part.

Choose a folder where the program will be installed. By default, the installation folder will be created as: **C:\Program Files\Paragon Software\Deployment Manager**. To select another folder, click the **Change…** button. Use the **Space** button to get information on available space of all disks in the system.

Do not install the program on network drives. Do not use Terminal Server sessions to install and run the program. In both cases, the program functionality will be limited.

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5. Set PXE Server (in case it's been selected to install). According to the current LAN configuration there are different work algorithms to set up the PXE Server:

- In case an active MS DHCP server is found on a local PC, the program will offer you to choose whether to configure it automatically right now or manually later.
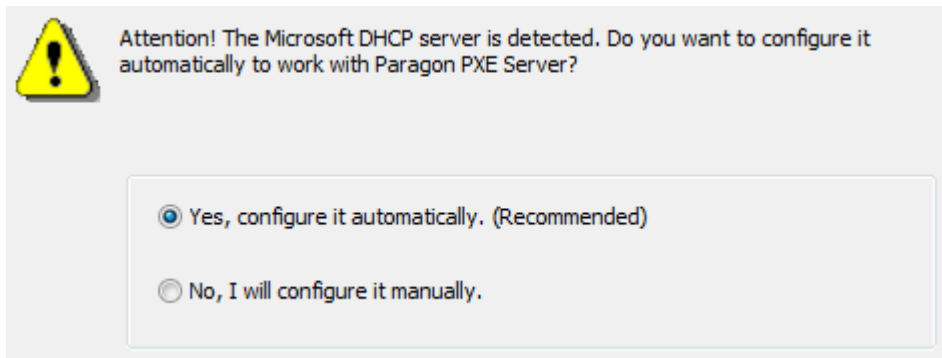
It is recommended to choose the automatic configuration. Then **Options 066 and 067** of the MS DHCP server will be automatically set up to work with our TFTP server. And after the product de-installation the original state will be restored.

If you choose the manual configuration, you'll have to configure the MS DHCP server manually after the installation is completed.

- In case no MS DHCP server has been found on a local PC, the program will ask you whether to install our DHCP server or not.
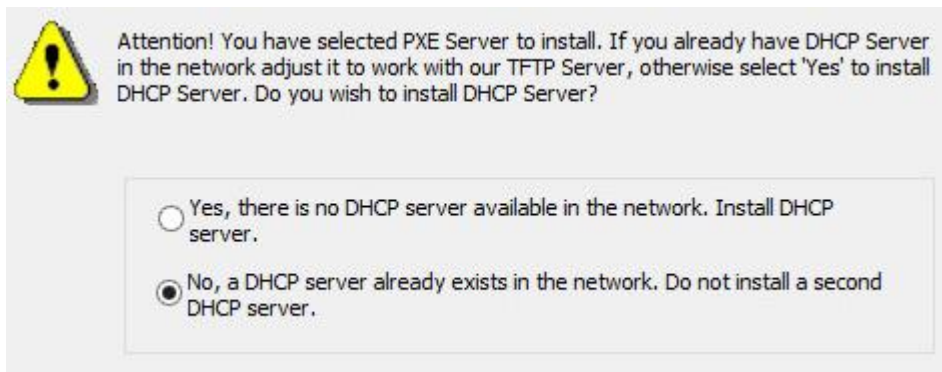
Click the **Yes** button if there is no DHCP server at all, thus the program will install and configure both DHCP and TFTP servers. Click the **No** button if there is an active DHCP server, in that case the program will only install the TFTP server, and then configure the current DHCP server to work with it.

To make the PXE Server work properly you should define DHCP parameters for the PXE Server.

> **If you've got reasons to use Paragon DHCP despite the fact that there's some other DHCP Server in your network environment, you need to configure your LAN infrastructure so that Paragon DHCP and the other DHCP send IP addresses to different network segments (subnets). Please note that both the Infrastructure Server and deployment client machines should be located in the Paragon DHCP subnet.**

6. Set location of backup images repository (in case the Infrastructure Server has been selected to install).

Path to the Archive Storage:

C:\ImageStorage\

Browse

> **To avoid any problems with mounting network shares the name should contain no more than 12 symbols.**

7. Set the Infrastructure Server (in case it's not been selected to install). You should define a name or IP address of the computer with the Infrastructure Server installed.

Deployment Infrastructure Server:

10.0.0.1

8. On the Ready to Install the Program page click **Install** to start the installation or **Back** to return to any of the previous pages and modify the installation settings.

9. The Final page reports the end of the setup process. Click **Finish** to complete the wizard. If you're using a 32-bit version of our product, you will be asked to restart the operating system.

10. If installing our product under Windows 7 with the turned on Windows Firewall, you will be prompted to allow access for Paragon's services (Firewall block notifications are to be enabled).

   When selecting Infrastructure Server to install:
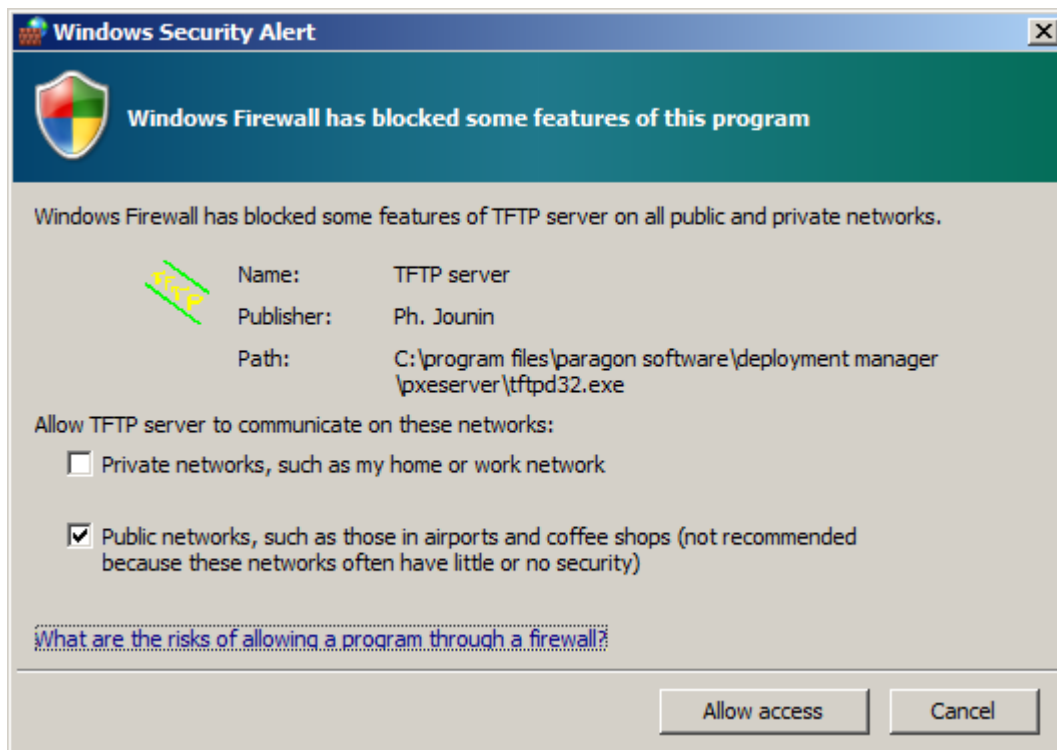
When selecting PXE Server to install:
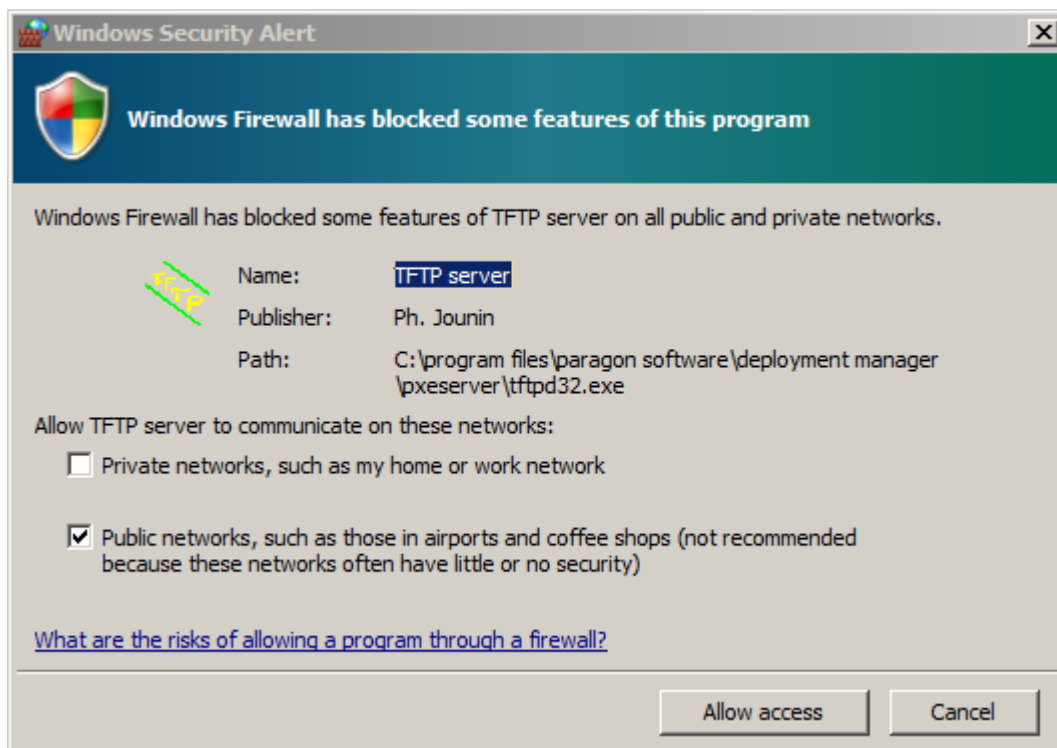
ℹ️ **If you're experiencing problems with our product, please consult Deployment Manager Troubleshooting Guide.**

First Start

To start Paragon Deployment Manager 11 under Windows, click on its desktop icon and then select **Programs > Paragon Deployment Manager™ 11 > Quick Start**.

> **The program provides wide opportunities in the field of hard disk structure modification, so just to be on the safe side, please make a backup of your data before carrying out any operation.**

The first component that will be displayed is called the Express Launcher. Thanks to a well thought-out categorization and hint system, it provides quick and easy access to wizards and utilities that we consider worth using on a regular basis. With its help you can also start up the help system or go to the program's home page.

- **Deployment Console** to set up and manage remote computers
- **PXE Server** (includes DHCP and TFTP services) to remotely boot client computers
- **Recovery Media Builder** to prepare client bootable media
- **Start/Stop Infrastructure Server** that is responsible for deployment initiation and control
- **Log Saver** to tackle problems with handling the program by compressing logs to send to the Paragon Support Team
- **Hard Disk Manager** (available in the **Advanced Options** section) to create/restore backup images or carry out partitioning operations, etc. To know more about Paragon Hard Disk Manager, please consult its documentation

Basic Concepts

This chapter explains terms and ideas that show how the program works. To understand these helps to obtain a general notion of the operation performance and makes it easier for you to operate the program.

Multicast versus Broadcast and Unicast in the Framework of System Deployment

In the course of time there have been developed three principal techniques as far as transmission of data on the network is concerned, i.e. Unicast, Broadcast and the cutting edge Multicast. Offering diverse work concept, all the three are used for accomplishing specific tasks. Let us just see how these transmission techniques can be applied to the system deployment issue.

In general system deployment involves simultaneous deployment of multiple computers for the manufacturing purposes. As for the network capacities this procedure is realized as transmission of some standardized backup images from the Server to multiple Target computers. Thus the most suitable data transmission technique is to offer the following relevant characteristics:

- Simultaneous transmission of one image to many computers without any redundant packet duplication

- The least possible Server work-load

- Open scalability

To get a better notion of the problem, let us just scrutinize the three transmission techniques a bit more closely.

Unicast

As the name infers, Unicast involves traffic going from one host to another. A copy of every packet goes to every host that requests it. Unicast is easy to implement as it uses well established IP protocols, however it becomes extremely inefficient when many to many communication is required. Since a copy of every packet must be sent to every host requesting access to the data this type of transmission is inefficient in terms of both network and server resources and presents fairly obvious scalability issues.

Nevertheless as far as the system deployment issue is concerned, in some particular cases the Unicast technique can offer pretty much flexibility, allowing you for instance to start a deployment session immediately from the client side, thus bypassing the central console management.
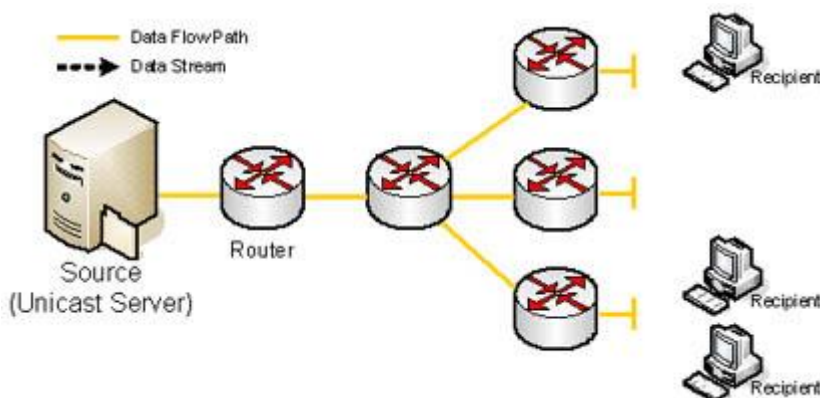
Broadcast

Broadcast seems to be a solution, but it's not certainly the solution. If you want all the hosts in your LAN be deployed, you may use broadcast. Broadcast provides the possibility for one host, typically a server, to send to all receivers on a subnet. Packets will be sent only once and every host will receive them as they are sent to the broadcast address. The problem arises when perhaps only particular hosts and not all are to receive those packets. Broadcast packets must be

processed, regardless of whether or not some certain hosts are interested in the broadcast. Thus, all hosts on that subnet will see increased CPU usage, which is not efficient for hosts not participating in the broadcast.
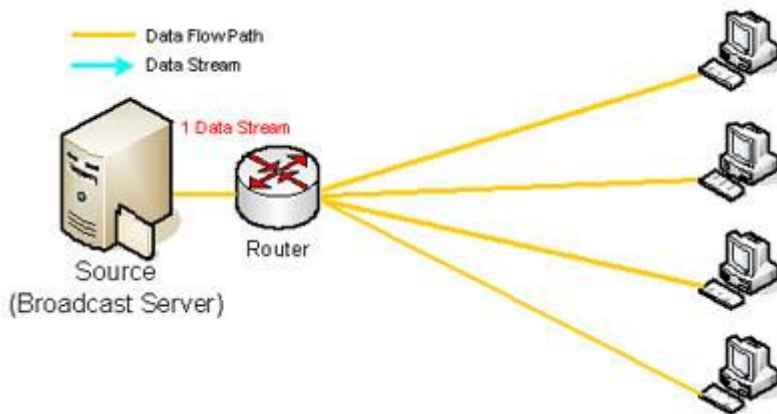
Multicast

Developed back in the 1980s, multicast is an efficient transmission scheme for supporting group communication in networks. The concept of a group is crucial to multicasting. Every multicast requires a multicast group; the sender (or source) transmits to the group address, and only members of the group can receive the multicast data. A group is defined by a Class D address in the address space **224.0.0.0**-**239.255.255.255**. Contrasted with unicast, where multiple point-to-point connections must be used to support communications among a group of users, multicast is more efficient because each data packet is replicated in the network - at the branching points leading to distinguished destinations, thus reducing the transmission load on the data sources and traffic load on the network links.
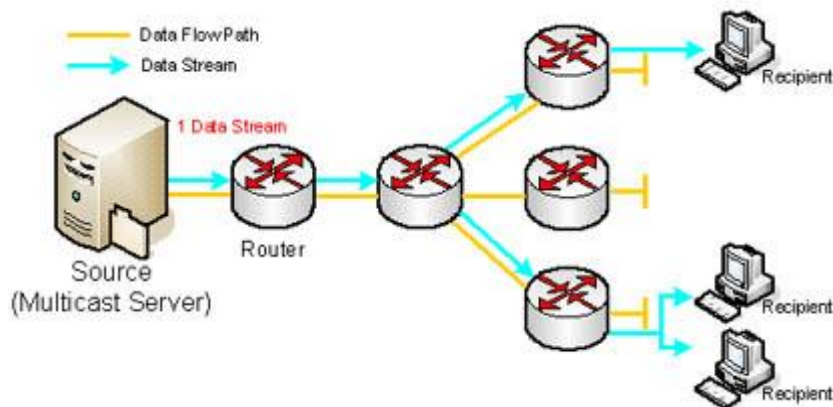
To sum up, it should be mentioned that the multicast technology is the most suitable for the system deployment, since, instead of sending thousands of copies of backup images, the server streams a single flow that is then directed by routers on the network to the target computers that have indicated that they want to receive the data. This eliminates the need to send redundant traffic over the network and also tends to eliminate CPU load on systems that are not using the multicast stream, yielding significant enhancements to efficiency for both server and network.

Paragon Multicast Architecture
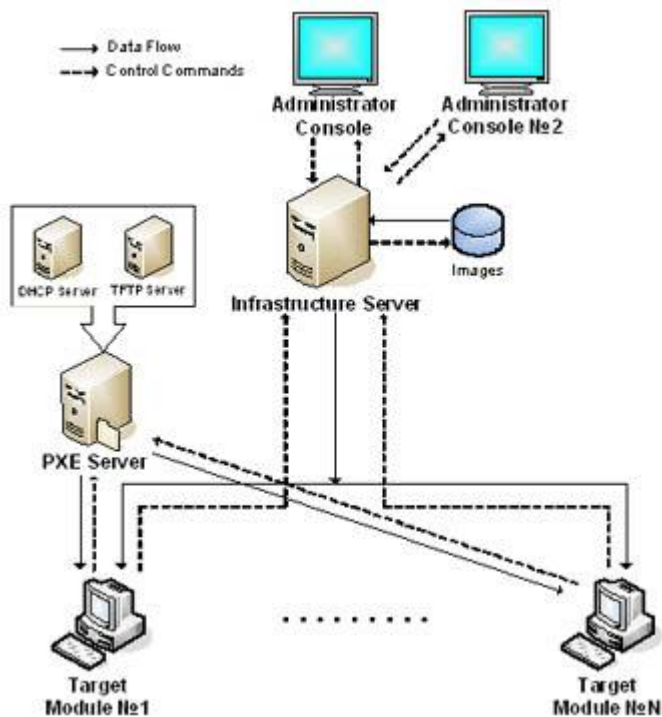
Explanation:

- There can be several Administrator Consoles

- The Administrator Console sends instructions (create/delete/start/stop/close… deployment session parameters, receive logs) to the Infrastructure Server and enables to manage and monitor the deployment procedure

- The Infrastructure Server initiates and controls the deployment procedure

- Master images (backup archives) can be placed separately (on a File Server) from the Infrastructure Server

- PXE Server – a PC with the DHCP and TFTP servers; Images from the PXE server are WinPE or Linux based, and prepared by Paragon; Target Module – an object of the deployment procedure.

> **To optimize the network performance it is strongly recommended to install the Infrastructure Server on a File Server where master images are kept.**

Deployment Console Functionality

This chapter introduces the console functionality to you. The Deployment Console offers a user-friendly interface that helps to effectively accomplish required operations while minimizing the possibility of making any mistake. Most operations are performed through the system of wizards. Buttons and menus are accompanied by easy understandable icons. Nevertheless, any problems that might occur while managing the program can be tackled by reading this very chapter.

Interface Overview

When you start the console, the first component that is displayed is called the Main Window. It enables you to run wizards, specify program settings and to visualize the operating environment.

The Main window can be conditionally subdivided into several sections that differ in their purpose and functionality:

1. Tool Button

2. Ribbon Panel

3. Tool Bar

4. Operations Panel

5. Recent Activity Panel

Some of the panels have similar functionality with a synchronized layout. The program enables you to conceal some of the panels to simplify the interface management.

Tool Button

By clicking on this button the user can:

- Get access to the program settings,

- Collect and send a log files package to the Support Team,

- Read the product manual,

- Go to Paragon's website to download a free update, register the product, visit Paragon's Knowledge Base, etc.

Ribbon Panel

An area across the top of the program's window is called the Ribbon Panel. It makes almost all the product capabilities available to the user in a single place. A Ribbon Tab is an area on the panel that contains buttons organized in groups by functionality. Each button corresponds to a certain program wizard or dialog.

The Ribbon Panel includes two Ribbon Tabs (**Home** and **View**). The first tab (selected by default) includes buttons to create or delete deployment sessions, or manage deployment templates (get information on all available templates, create new templates, edit or delete existing ones), while the second one serves for adjusting the operating environment, exactly information displayed on the Operations Panel (whether to show all deployment sessions, or for a certain period, or currently active, or show activity logs by clients or events).

> **If you'd like to hide all ribbon tabs, click on the arrow button at the right top corner of the program window.**

Tool Bar

The Tool Bar provides fast access to the most frequently used operations.

BUTTON	FUNCTIONALITY
Refresh	Refresh the contents of the Operations Panel
Expand All	Show detailed information on sessions
Collapse All	Hide detailed information on sessions
New Session	Create a new deployment session

Operations Panel

The Operations Panel is located in the center of the main window that emphasizes its importance. Depending on the defined settings, it may display all deployment sessions, or for a certain period (one day, week, month, year), or currently active, or show activity logs by clients or events.

Click on a session to expand and get detailed information on its properties, change any of the session parameters, view log, erase history, or delete the session.

To know more on how to manage sessions, please consult the Managing Sessions chapter.

Recent Activity Panel

The Recent Activity Panel lists all actions carried out by the program (recent activities at the top).

Settings

To call the Settings dialog, please click **Tool Button**, then select **Settings**. All the settings are grouped into several sections, which functions are described in the following paragraphs.

General Options

This section enables you to set a name or IP address of the Infrastructure Server used by default. It can be of great use when the Infrastructure Server has been migrated to some other location as it saves from reinstalling the Deployment Console.

The **If possible, show computer name** option enables to display the client's computer name instead of MAC address where possible.

The option will take effect only after the program restart.

Logs Options

In this section you can specify how many logs are to be stored for each deployment client (one by default).

Session Options

Here you can define how much time (in seconds) the program is to wait for clients to deploy.

The option will only be valid for newly created sessions.

Managing Templates

The Deployment Console provides the possibility to manage deployment templates (create new templates, edit or delete existing ones) without accomplishing the deployment procedure. All available templates are listed in a special window of the Home Ribbon Tab.
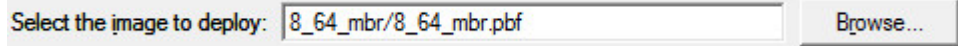
Creating new templates

To create a new session template, click the **Home** tab on the Ribbon Panel, then select **New Template**.
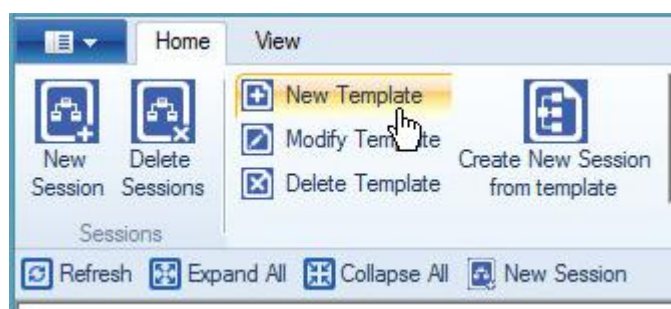
The wizard is so well designed that you simply need to follow its easy step-by-step instructions to carry out the operation. Here you set the parameters of the operation defining:

- **Image to deploy**. Select one of the previously created with Paragon Hard Disk Manager images to be deployed. The wizard supports .PBF and .pVHD backup image formats.

Select the image to deploy: 8_64_mbr/8_64_mbr.pbf   Browse...
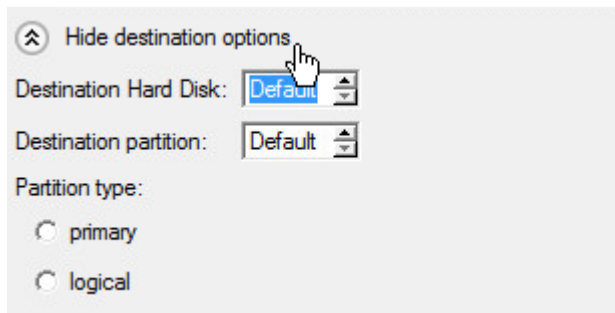
> **The current version can work with pVHD images containing entire hard disks only.**
>
> **To know more about Paragon Hard Disk Manager, please consult its documentation.**

- **Template name**. After selecting the required image to deploy, the wizard automatically offers an easy to understand name containing the archive name itself. It also leaves the possibility to set the name manually.

Set name of the session: Template 8_64_mbr

Note: This name can be automatically changed by the infrastructure server to enforce name uniqueness.

- **Destination options**. In this section you can specify a hard disk or partition number (partition type considered, if necessary) to deploy the specified image to. Please note that a hard disk number can be used for both HDD and partition-based images, while a partition type and number can be applied to partition images only. If not defined, these values will be derived from the specified image.

Hide destination options
Destination Hard Disk: Default
Destination partition: Default
Partition type:
○ primary
○ logical

- **Session type**. This section enables to switch between three options:

● Automatic mode, clients are assigned to deploy automatically after starting
○ Clients to deploy are defined by Session ID on the bootable client media
    Session ID:
○ Clients to deploy are defined by MAC address
□ Create as ConstantCast session
    The targets can be connected at any moment during processing

- **Automatic mode**, when clients to deploy are automatically assigned after the session is launched;
- **By session ID**, when clients to deploy are defined according to Session ID of a particular bootable client media (Session ID should be set when creating media with Recovery Media Builder);

- **By MAC address**, when clients to deploy are defined according to their MAC addresses (on the next page you will be asked to choose the desired MAC addresses from available on the network at the moment, or load the previously created list).

In addition, the **ConstantCast** mode is allowed for each session type. If active, target machines will be able to join the session at any moment during the process.

- **Session parameters**. Specify a number of additional parameters that will affect the deployment process:

- The highest possible number of active targets (one by default);

- The minimum number of active targets (100% by default);

- Session time limit (unlimited by default).

- **Use of Post-Config options**. After the deployment procedure is accomplished, it is possible to send additional data to the clients. It can be a sysprep file, some script, drivers, etc. Just press the **Browse** button to search for the required configuration file.

The Deployment Manager package comes with a set of ready-made post-config templates that can be found in the Image Storage directory. To know more on the subject, please consult the Post-Config Usage chapter.

As a result of the operation you get a new template on the list of available templates.

Modifying existing templates

There are several ways to modify an existing template:

- Click the **Home** tab on the Ribbon Panel, then select **Modify Template**.

- Call the popup menu for the selected template (right click of the mouse button) on the list of templates and then choose the menu item: **Modify Template**

After following one of the above mentioned actions, the Welcome page of the Edit Deployment Template Wizard is displayed. The work algorithm is practically the same as described in the Creating new templates chapter, except you can see all the previously set parameters of the selected template to make the necessary modifications.

As a result of the operation you receive a modified template on the list of available templates.

Deleting templates

There are several ways to delete a template:

- Click the **Home** tab on the Ribbon Panel, then select **Delete Template**.

- Call the popup menu for the selected template (right click of the mouse button) on the list of templates and then choose the menu item: **Delete Template**

After following one of the above mentioned actions, you're offered to confirm deletion of the selected template.

Managing Sessions

With the Deployment Console you can easily manage sessions (create new sessions, modify or delete existing ones).

Creating new sessions

There are several ways to create a new session:

- Click the **Home** tab on the Ribbon Panel, then select **New Session**.

- Click the **New Session** button on the Tool Bar.
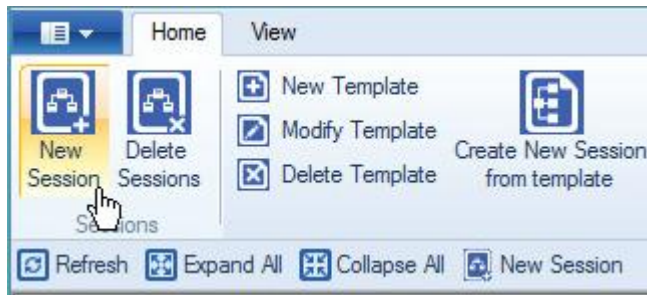
The wizard is so well designed that you simply need to follow its easy step-by-step instructions to carry out the operation. Here you set the parameters of the operation defining:
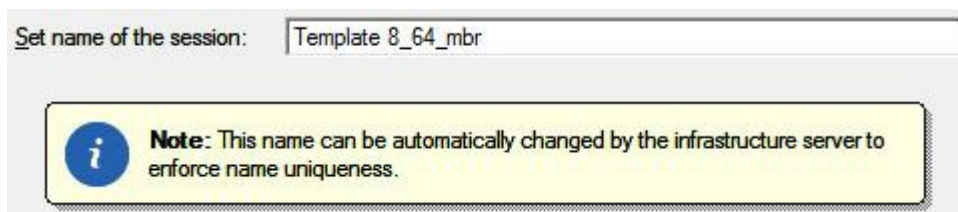
- **Use of a deployment template**. You may use a previously created deployment template to launch a new session. In this case the wizard will only offer you to enter a session name and schedule the operation.

  In case there are no available templates or you're not willing to use any, the wizard will proceed through all the steps.
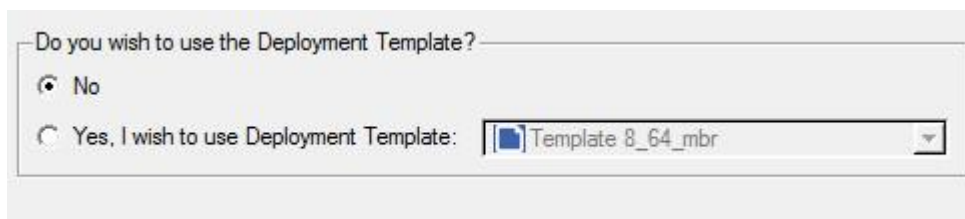
- **Image to deploy**. Select one of the previously created with Paragon Hard Disk Manager images to be deployed. The wizard supports .PBF and .pVHD backup image formats.
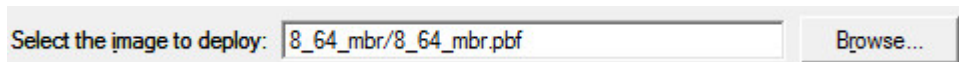
> **ⓘ** The current version can work with pVHD images containing entire hard disks only.
>
> To know more about Paragon Hard Disk Manager, please consult its documentation.
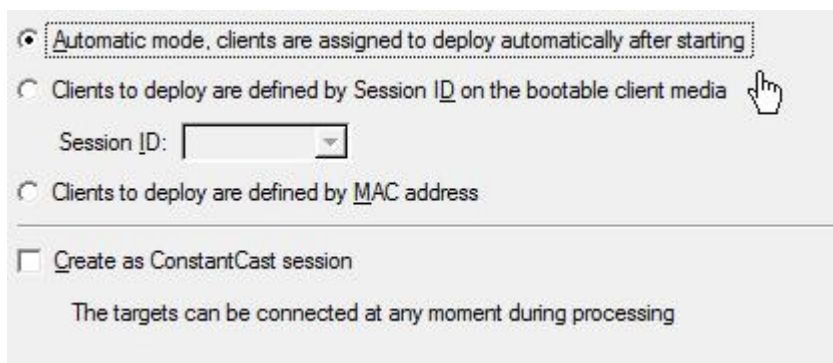
- **Session name**. After selecting the required image to deploy, the wizard automatically offers an easy to understand name containing the archive name itself. It also leaves the possibility to set the name manually.

- **Destination options**. In this section you can specify a hard disk or partition number (partition type considered, if necessary) to deploy the specified image to. Please note that a hard disk number can be used for both HDD and partition-based images, while a partition type and number can be applied to partition images only. If not defined, these values will be derived from the specified image.

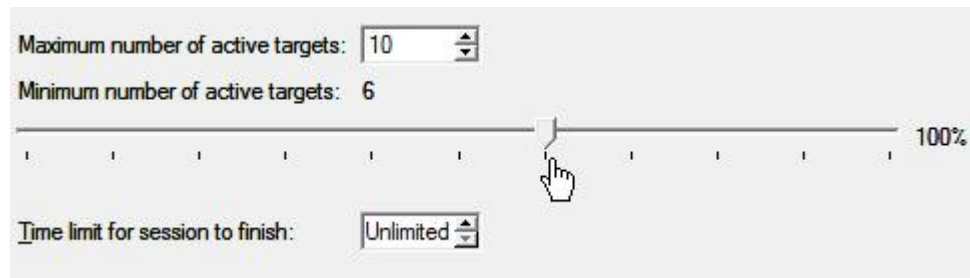- **Session type**. This section enables to switch between three options:

- - **Automatic mode**, when clients to deploy are automatically assigned after the session is launched;

- - **By session ID**, when clients to deploy are defined according to Session ID of a particular bootable client media (Session ID should be set when creating media with Recovery Media Builder);

- - **By MAC address**, when clients to deploy are defined according to their MAC addresses (on the next page you will be asked to choose the desired MAC addresses from available on the network at the moment, or load the previously created list).
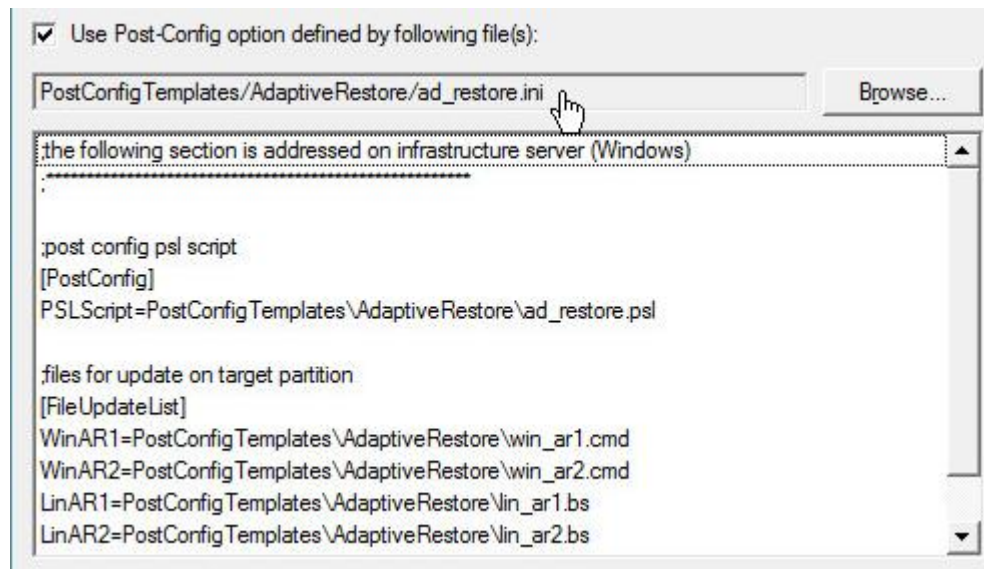
In addition, the **ConstantCast** mode is allowed for each session type. If active, target machines will be able to join the session at any moment during the process.

- **Session parameters**. Specify a number of additional parameters that will affect the deployment process:

- - The highest possible number of active targets (one by default);

- - The minimum number of active targets (100% by default);

- - Session time limit (unlimited by default).

- **Use of Post-Config options**. After the deployment procedure is accomplished, it is possible to send additional data to the clients. It can be a sysprep file, some script, drivers, etc. Just press the **Browse** button to search for the required configuration file.
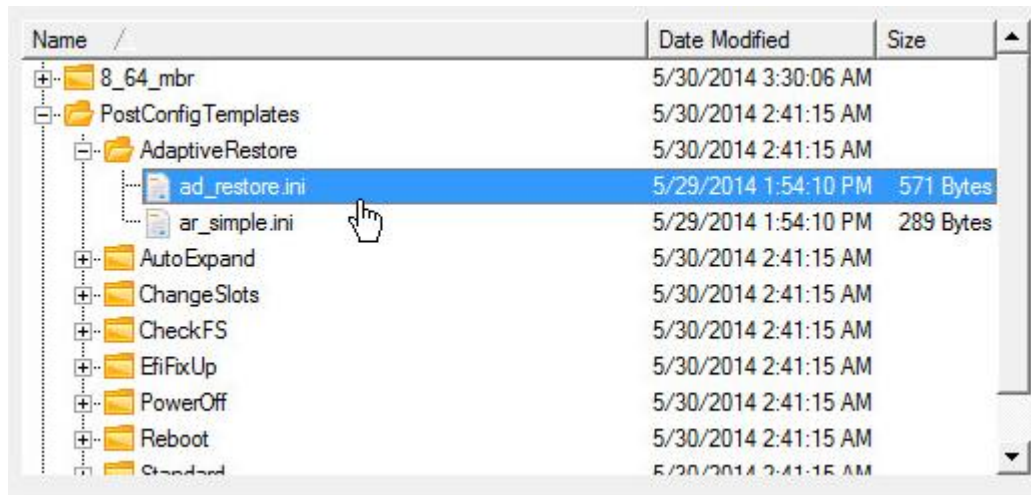
The Deployment Manager package comes with a set of ready-made post-config templates that can be found in the Image Storage directory. To know more on the subject, please consult the Post-Config Usage chapter.

- **Schedule the operation**. The program allows you to automate deployment operations. The utility for this purpose is referred to as the embedded Scheduler, which is used to specify the time for the execution. There are several available options. Depending on the choice, the scheduler will display a form that allows you to set the schedule:
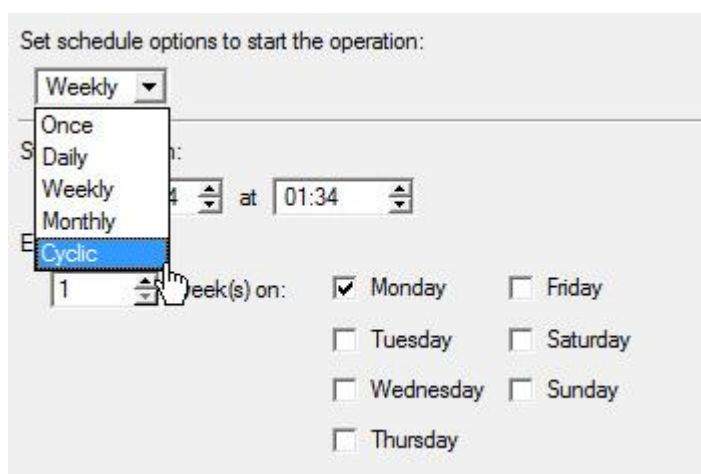
- **Cyclic**. Mark the option to carry out a cyclic deployment procedure, thus one and the same session will automatically be repeated until it is stopped by the user.

> ℹ️ **The option is not available for a session where clients to deploy are defined by MAC addresses.**

- **Once**. Mark the option to define the date and time when the session is to be launched.

- **Daily**. Mark the option to define the time when the session is to be launched, a period during which the operation will be performed (in days), the date when the operation will be started first and the date after which the task will be deleted from the scheduler's waiting list.

- **Weekly**. Mark the option to define the time when the session is to be launched, a period during which the operation will be performed (in weeks), days of the week, when the operation will be started, the date when the operation will be started for the first time and the date when the operation will cease to run.

- **Monthly**. Mark the option to define the time when the session is to be launched, a day of a month when the operation starts, the date when the operation will be started for the first time and the date when the operation will cease to run.

As a result of the operation you receive a new session that will be run according to the specified parameters.

> ℹ️ **All steps of the New Deployment Session Wizard can be saved in form of a [template](#) for further use.**

Creating a new session from template

There are several ways to create a new session from one of available templates:

- Click the **Home** tab on the Ribbon Panel, select the required template, then **Create New Session from template**.

- Call the popup menu for the selected template (right click of the mouse button) on the list of templates and then choose the menu item: **Create New Session from template**
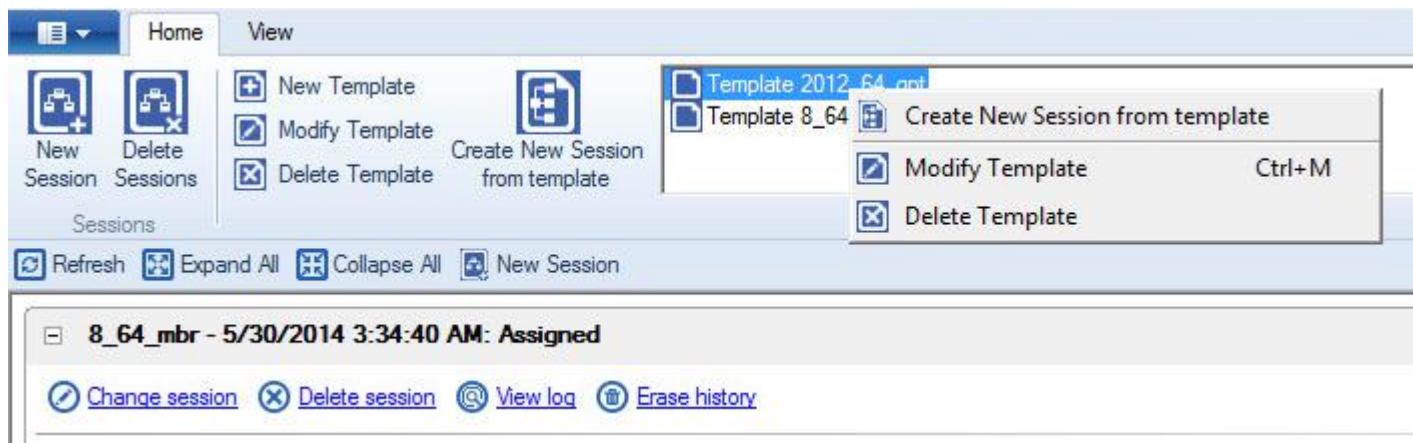
After following one of the above mentioned actions, the New Deployment Session Wizard will offer you to [enter a session name](#) and [schedule the operation](#).

As a result of the operation you receive a new session based on the selected template.

Modifying sessions

To modify a deployment session, expand it on the Operations Panel, and then click the **Change session** link.
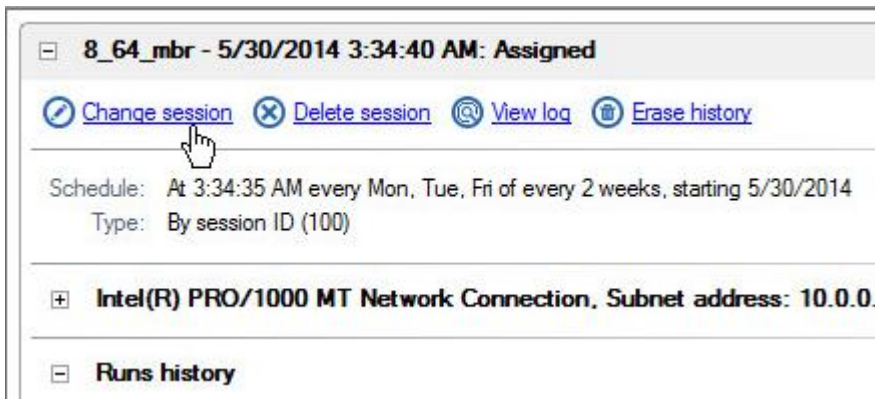
After following one of the above mentioned actions, the Welcome page of the Edit Deployment Session Wizard is displayed. The work algorithm is practically the same as described in the Creating new sessions chapter, except you can see all the previously set parameters of the selected session to make the necessary modifications.

As a result of the operation you receive a modified session.

Deleting sessions

There are several ways to delete a session:

- Click the **Home** tab on the Ribbon Panel, then select **Delete Session**.
- Expand a session on the Operations Panel, and then click the **Delete session** link.

After following one of the above mentioned actions, you're offered to confirm deletion of the selected session.

Post-Config Usage

After the deployment procedure is accomplished, the program enables to easily customize the client disk layout and set up the required Windows settings (PC name, DNS, display, etc.). Especially for that purpose the so called Post-Config options have been introduced.
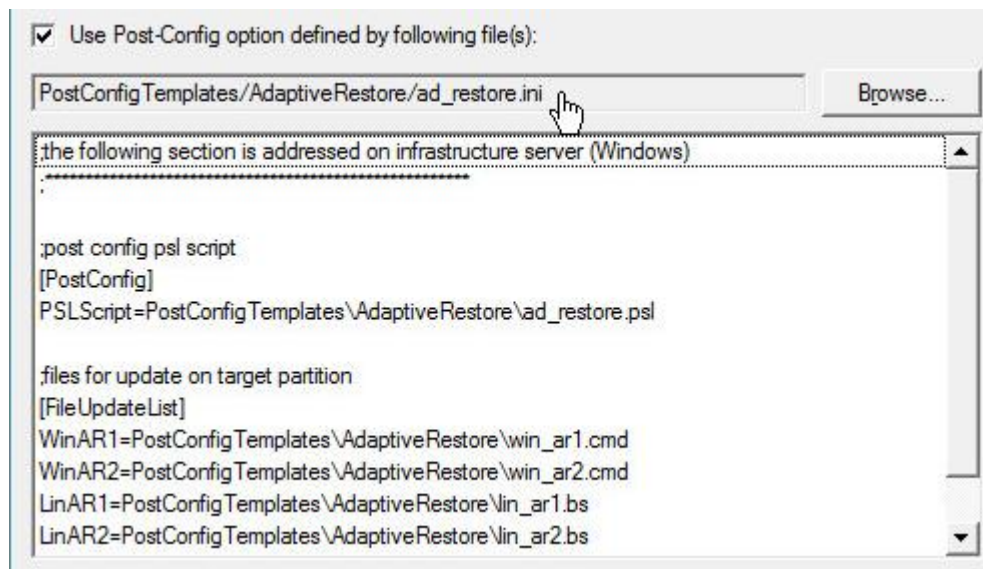
To make good use of them you should bear in mind the following issues:

- Options can only be defined through one configuration **.ini** file of a certain format;

> **[Post-Config]**   // to define a **.psl** script for the Post-Config
> **PSLScript=Post-ConfigTemplates\FileUpdate\fileupdate.psl**
>
> **[FileUpdateList]**   // to define files to update

```
SysprepINF=Post-ConfigTemplates\FileUpdate\sysprep.inf
```

- Options cover a limited range of functionality:
  - Set a Paragon script for execution after deployment;
  - Update files on the client computer after deployment;
  - Modify **.ini** files on the client computer after deployment.

The Deployment Manager package comes with a set of ready-made post-config templates that can be found in the Image Storage directory.
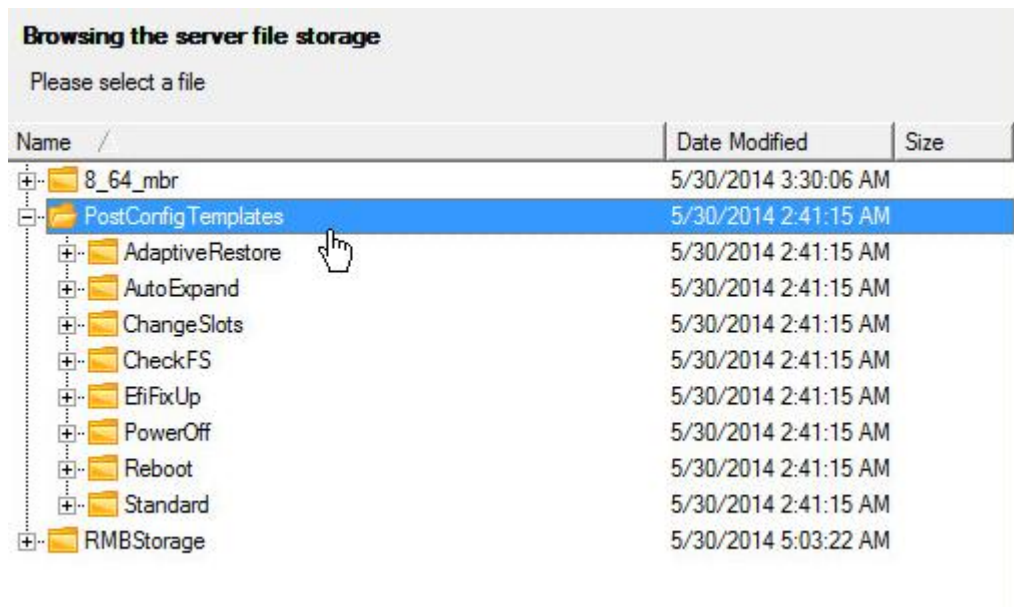
Most of them are completely automated and require no manual modification, except for AdaptiveRestore, FileUpdate, FileUpdateVista.

You can find how to configure these templates according to your needs below.

Adaptive Restore Template

Adaptive Restore is a special technology that enables to successfully recover Windows 2000/XP/Server 2003 as well as Windows Vista/7/8/8.1/Server 2008/2012 to a different hardware configuration.

Adaptive Restore for Windows 2000/XP/Server 2003 actually implies two operations:

- **Providing the ability to change the Windows kernel settings** to the most suitable for your new configuration. The program will automatically add all available Windows HAL and kernels to the boot menu (the boot.ini file) to choose the required platform in case your system fails to boot (Uniprocessor, Multiprocessor, or Old legacy PC without ACPI). You can later remove them from the menu either under Windows or with Boot Corrector.

If you've got a 64-bit operating system, no options will be added to the boot menu.

- **Automatic replacement of the boot critical drivers** (HDD controller, PS/2 and USB mouse and keyboard) to the default Windows drivers to provide the maximum level of compatibility. Once your Windows starts up, it will

initiate reconfiguration of all Plug'n'Play devices, so it is recommended to provide the latest drivers for your motherboard and processor at this step, as it can considerably improve the overall performance of your system.

> **The current version of the program does not enable to add any 3rd party driver during the operation, which may lead to boot problems (relevant for SCSI and Serial ATA controllers mostly). In some cases however you can tackle the problem by switching the required device to the standard ATA compatible mode in BIOS (e.g. the Intel ICH8 controller can be set in the IDE mode, not AHCI). Moreover if you're going to upgrade your motherboard to one of the same manufacturer, just update the driver before the operation to guarantee successful startup of your system later.**

Adaptive Restore for Windows Vista/7/8/8.1/Server 2008/2012 is based on the fact that these operating systems do not delete their distributive driver repositories after the setup, but simply make them inactive in the Windows Registry. So thanks to Adaptive Restore technology these driver repositories can be made available during the restore procedure to let Windows OS automatically find and install any lacking driver with no action from your side required, what is very convenient.

However you might face a situation when no driver has been found in the driver repository. In this case you will have to provide an exact location of the required drivers. With a large amount of client computers it may be difficult to insert Windows distributive CD/DVD every time it is required. To make an operating system install extra drivers automatically, just copy them to a shared folder on the network. After you specify a path to a remote driver repository in the **ad_restore.psl** script, all drivers will be copied to a pre-defined folder on a target PC, and the system registry will be modified to automatically search for drivers in a specified folder.

> **Our product includes two adaptive restore scripts (ad_restore.psl and ar_simple.psl). In this guide we will only consider the ar_simple.psl, which has no option to inject drivers from user-defined repositories. If you need this functionality, please consult Deployment Manager Troubleshooting Guide to learn more about ad_restore.psl.**
>
> **You can find both scripts in the [Image Storage](#) directory, which is by default: C:\ImageStorage\PostConfigTemplates\AdaptiveRestore**

Configuring ar_simple.psl

1. To set all necessary parameters, open the **ar_simple.psl** script with a text editor.
2. Make sure that the **<disk_n>** and **<sys_part>** values match the HDD and system partition numbers on a destination PC.
3. Save and close the script. Now it is ready to use.

FileUpdate Template

FileUpdate is closely connected with the Sysprep utility. The Microsoft Sysprep is a handy tool specially designed for system administrators, OEM (Original Equipment Manufacturers) System Builders, etc. to automatically deploy Windows based operating systems on multiple computers. With Sysprep you can easily remove all the unique information from a Master PC (used as a sample computer) in order to make it ready to deploy its image to other computers of different

hardware configuration. Besides it enables to automatically set up additional configuration options (workgroup, domain, organization name, PC name, default display size, etc.).

For Windows XP all the Sysprep configuration information is kept in one simple **.inf** file.

> **To know more about the Microsoft Sysprep functionality, please consult documentation that comes with the utility.**

Depending on a computer's MAC address, the FileUpdate template enables to set up different configuration options (e.g. PC name) automatically after the deployment is over.

> **Since Windows Vista there has been used a different format of the answer file, so please use the FileUpdateVista template for these operating systems.**

To deploy a system with the FileUpdate option, you need to accomplish the following steps:

1. Run **sysprep.exe** on a master PC with a pre-installed operating system.

2. Create a disk or partition image with Hard Disk Manager.

3. Prepare the Sysprep answer file. It's a text file that scripts answers to a series of the GUI dialog boxes. To create it, please use a text editor or the Windows Setup Manager tool. The easiest way however is to modify the Sysprep.inf file that comes with our template (**<ImageStorage>\Post-ConfigTemplates\FileUpdate**). You're to specify there all common configuration options like TimeZone or Workgroup.

4. Edit the **FileUpdate.ini** file that comes with our template. For each PC to configure after the deployment, there should be created a section describing specific parameters like ComputerName. An example is already included in our template:

   > **;update [UserData] section on PC 1**
   >
   > **;you are to set the correct MAC address!!!**
   >
   > **[00-0A-48-00-DD-1A.SysprepInf.UserData]**
   >
   > **FullName="Client1"**
   >
   > **OrgName="Company1"**
   >
   > **ComputerName="Computer1"**

   You can add/remove any configuration option you'd like to set up after the deployment.

   You should also modify the default path **ufsd://HARD0/PARTITION0/sysprep/sysprep.inf** if the system partition is supposed to restore not to **HDD 0, partition 0**.

5. Create a new deployment session using the prepared image and the **FileUpdate.ini** file for post-config.

FileUpdateVista Template

FileUpdateVista has much in common with FileUpdate, except for one thing – you cannot set different configuration options for different computes in one and the same session.

To deploy a system with the FileUpdateVista option, you need to accomplish the following steps:

1. Run **sysprep.exe** on a master PC with a pre-installed operating system (Windows Vista or later versions).

2. Create a disk or partition image with Hard Disk Manager.

3. Prepare the Sysprep answer file with Windows System Image Manager. You can also modify the **Unattend.xml** file that comes with our template (**<ImageStorage>\Post-ConfigTemplates\FileUpdateVista**). You're to specify there all common configuration options like ProductKey or Workgroup.

4. Edit the **FileUpdate.ini** file that comes with our template, if the system partition is supposed to restore not to **HDD 0, partition 0**. Please make sure the correct destination path is specified in the following section:

```
;destination to update unattend.xml

[XMLUpdate]

Destination =
ufsd://HARD0/PARTITION0/Windows/Panther/unattend.xml
```

5. Create a new deployment session using the prepared image and the **VistaUpdate.ini** file for post-config.

Target Related Functionality

This chapter introduces the target module functionality to you. As it was already mentioned in the previous chapters, the main purpose of the Target Module is to get client computers ready for deployment. It can be initiated either with the help of the bootable media or the PXE facilities. Recovery Media Builder can help you prepare the Target Module based on Linux SuSe or Windows PE.

Preparing Target Module

Recovery Media Builder is a wizard that helps you prepare either Linux or WinPE-based bootable environment on a USB thumb drive, in an ISO or PXE image. This environment will get client machines ready for deployment procedure.

System Prerequisites

- A Windows XP platform or higher;
- A USB thumb drive of at least 512 MBs.

Please note that depending on the host system the product functionality can be restricted:

- You can specify whether to create a 32-bit (BIOS mode) or 64-bit (uEFI mode) Linux environment only in the 64-bit Recovery Media Builder. The 32-bit Recovery Media Builder can only prepare 32-bit Linux media.
- There's no option to choose whether to build a 32-bit (BIOS mode) or 64-bit (uEFI mode) WinPE environment. For 64-bit systems there will be built 64-bit WinPE, while for 32-bit systems – 32-bit.
- Creation of WinPE-based ISO images is not available on Windows 8.1, Server 2012 R1/R2 if there's no ADK installed in the system.

Building WinPE Environment on Flash

1. Plug in a thumb drive of at least 512 MBs in size. Please note all data on that drive will be deleted.

2. Select: **Start > Programs > Deployment Manager 11™ > Paragon Recovery Media Builder™ > Recovery Media Builder**, or launch it through the Express Launcher.

3. The welcome page introduces the wizard's functionality. Besides you can see the following option here:

Welcome to the Recovery Media Builder wizard

Recovery Media Builder helps you to prepare a Linux- or WinPE-based bootable environment on a USB thumb drive or in an ISO file. This recovery environment contains a set of utilities that corresponds to the purchased product, and allows startup of your computer for maintenance or recovery purposes when OS is corrupted or cannot be used.

☐ **Use ADK/WAIK**

The wizard will use WIM image of the current operation system when creating the Recovery Environment on Windows PE platform. Select this option if you'd like to use ADK or WAIK for building Windows PE image.

- **Use ADK/WAIK**. When running under Windows 7 or later OS, Recovery Media Builder doesn't require Windows Assessment and Deployment Kit (ADK) or Automated Installation Kit (WAIK) to be installed in the system to build a WinPE-based environment, as it can directly use WIM image inside the operating system. So if having to do with Windows XP, Vista, or Server 2003 please mark this option and make sure one of the mentioned above kits is present in your system. You should also use this option, if Windows OS has been modified by the system builder as a result of which WIM image is missing. As you can see this option is relevant for Windows PE images only.

WAIK/ADK is a Microsoft's proprietary tool and can be obtained from its Download Center for free. Please note that you need a genuine Windows installation to be able to download this tool. Moreover you will need to download a version, which is suitable for your Windows OS – Recovery Media Builder automatically detects your system and offers the required download link.

Some Windows x64 RE installed images (on Win7x64 and some builds of Win8) contain an invalid EFI PXE boot loader. If you've got no problems with booting WinPE x64 PXE image in the legacy BIOS mode ("winpe.cfg"), but fail to boot in the uEFI mode ("efipe.cfg") you are to do the following:

- **Install Windows 8 ADK on an x64 machine hosting Recovery Media Builder.**
- **Set the parameter "Use WAIK/ADK" on in the RMB settings.**
- **Rebuild WinPE PXE image.**

4. RMB allows creating bootable media based on one of the following options:

- **Use new or existing boot media configuration**. Use options from the drop-down list to either select one of the predefined configurations or create your own (our choice).
- **ISO image**. Browse for an .ISO file to make bootable media out of it. Optionally you will be able to add additional files to the resulted media.
- **WIM image (Windows PE only)**. Browse for a .WIM file to make WinPE-based bootable media out of it. Please note that you won't be able to modify boot media parameters.
- **A folder (Windows PE only)**. Browse for a directory that will serve as source for WinPE-based bootable media. Please note that you should edit all configuration files manually beforehand.

5. Select **Microsoft Windows PE**. As you can see on the screenshot there's no option to choose whether to build a 32-bit (BIOS mode) or 64-bit (uEFI mode) WinPE environment. For 64-bit systems there will be built 64-bit WinPE, while for 32-bit systems – 32-bit.

Recovery media platform

◉ Microsoft Windows PE

○ Linux

   Please select firmware interface:

   ○ EFI

   ◉ BIOS

The 64-bit version of Recovery Media Builder prepares hybrid (both, uEFI and BIOS compatible) 64-bit recovery environment on flash or in an ISO image.

6. Specify available boot menu items for the future media by marking/unmarking checkboxes opposite item names.

Set boot media menu options

To select menu item click the checkbox next to item name:

- ✔ Client-driven mode
- ✔ Command prompt
- ✔ Hard disk manager
- ✔ Load driver
- ✔ Logs collector
- ✔ Restart computer
- ✔ Server-driven mode
- ✔ Shutdown computer
- ✔ Simple restore wizard

You've got the option to add custom scripts written in Paragon's Scripting Language (PSL) to be able to start them after the startup.

Set up custom scripts:

⊟ **No custom script files**

Add script file

To add a .PSL script to the media, please click the corresponding link, and then browse for the required file.

Look in: | Local Disk (C:) ▼

Name	Size	Date
⊟ 📇 Local Disk (C:)		
⊞ 📁 ImageStorage		5/28/2014 3:04:56 AM
⊞ 📁 PerfLogs		8/22/2013 8:22:35 AM
⊞ 📁 Program Files		5/28/2014 3:04:56 AM
⊞ 📁 Program Files (x86)		5/28/2014 3:04:56 AM
⊞ 📁 Users		9/3/2013 1:57:44 PM
⊞ 📁 Windows		9/3/2013 11:06:59 AM
⊞ 💿 DVD Drive (D:)		

File name: | _____

Files of type: | PSL scripts ▼

If required you can define what component of the menu will be automatically selected on the expiry of a certain time limit (10 seconds by default).

☐ No custom script files

Add scrip | Client-driven mode
Command prompt
Hard disk manager
Load driver
Logs collector
Restart computer
Server-driven mode
Shutdown computer
☑ Set defau | Simple restore wizard

Default item: | Server-driven mode ▼   Delay in seconds: 10 ⬍

7. To deploy machines in the server-driven mode, please set the following parameters:

Set server-driven mode options

☑ Set Session ID for Server-driven mode

Session ID: 100 ⬍

Destination hard disk: 0 ⬍

Before deployment options:

☐ Clear the hard disk before deployment

☐ Assign PSL script to execute before deplyment:

Script file: | _____ | Browse...

After deployment options

☐ Hide partitions after deployment

☑ Do UEFI NVRAM fix-up

- **Set Session ID…** Assign certain clients to the required deployment session by using the Session ID identifier (100 by default).
- **Destination hard disk**. Choose where to deploy a backup image of a separate partition/single hard disk.

Before deployment options:

- **Clear the hard disk before deployment** to make sure there is no data on it, thus avoiding any possible troubles.
- **Assign PSL script to execute…** Browse for a .PSL script file you'd like to be automatically executed before the deployment (can be certain drive partitioning operations to accomplish on client machines).

After deployment options:

- **Hide partitions after deployment**. Mark the option if you'd like partitions to be hidden on client machines after deployment.
- **Do UEFI NVRAM fix-up**. Mark the option to make a 64-bit Windows OS configured to the uEFI boot mode to successfully start up on client machines after deployment.

8. To deploy machines in the client-driven mode, please set the following additional parameters:

Set client-driven mode options

☑ Specify Infrastructure server
    ◉ By name: 7-64-Ultimate
    ○ By IP address:

☑ Specify image to deploy from the image storage:
     arc_xp\arc_xp.PBF
Destination hard disk: 0

- **Specify Infrastructure Server**. You should set a name or IP address of the required Infrastructure Server. In case the Infrastructure Server has not been set in this section, the program will automatically offer to do it after the Deployment Wizard is launched.
- **Specify image to deploy from the Image Storage**. Set a path to a backup image created in Hard Disk Manager that you'd like to deploy to client machines. In case the image has not been specified in this section, the program will automatically offer to do it after the Deployment Wizard is launched.
- **Destination hard disk**. You can set a hard disk to deploy a backup image to (if there are several on client machines). This parameter will not be taken into account if a backup image contains more than one hard disk.

9. Click on **Removable flash media**, then select a thumb drive from the list of flash memory devices available in the system at the moment (if several). If you'd like to create an ISO or PXE image of the WinPE environment, please use the appropriate option.

Recovery media format

⦿ ISO image

Please specify image file location:

C:\Users\Administrator\Documents\rm_28_05_2014.iso [Browse...]

○ Removable flash media

Please select USB-flash drive:

USB Drive 4, Kingston DataTraveler 2.0 (3.6 GB)

○ PXE image

Creation of WinPE-based ISO images is not available on Windows 8.1, Server 2012 R1/R2 if there's no ADK installed in the system.

When specifying 'PXE image' as the desired format, the 64-bit version of Recovery Media Builder will prepare two configurations to start up client machines either in the uEFI or BIOS mode. You need to specify the correct configuration in the PXE dialog. There's no way to start up both uEFI and BIOS compatible machines via one PXE session.

Some Windows x64 RE installed images (on Win7x64 and some builds of Win8) contain an invalid EFI PXE boot loader. If you've got no problems with booting WinPE x64 PXE image in the legacy BIOS mode ("winpe.cfg"), but fail to boot in the uEFI mode ("efipe.cfg") you are to do the following:

- **Install Windows 8 ADK on an x64 machine hosting Recovery Media Builder.**
- **Set the parameter "Use WAIK/ADK" on in the RMB settings.**
- **Rebuild WinPE PXE image.**

---

10. The wizard will warn you that all data on the selected drive will be deleted. Please confirm the operation to proceed.

> Are you sure you want to write the recovery environment to USB Drive 4, JetFlash Transcend 4GB (3.7 GB)?
>
> All the data on the selected USB-flash drive will be completely erased! Please, copy all important data first.
>
> [Yes] [No]

11. Set a label and add additional files to the root of the bootable media by clicking the corresponding link and browsing for required files. All injected files will be listed on this page.

Select files and folders to add to bootable media

Boot media label: |

Please select files or folders to add to the root folder of the Boot Media.

⊟ **No custom files and folders**
Add files and folders

Look in: Local Disk (C:)

Name	Size	Date
⊟ Local Disk (C:)		
⊞ ImageStorage		5/28/2014 3:04:56 AM
⊞ PerfLogs		8/22/2013 8:22:35 AM
⊞ Program Files		5/28/2014 3:04:56 AM
⊞ Program Files (x86)		5/28/2014 3:04:56 AM
⊞ Users		9/3/2013 1:57:44 PM
⊞ Windows		9/3/2013 11:06:59 AM
⊞ DVD Drive (D:)		
⊞ RecoveryMedia (E:)		

File name:

Files of type: All files

Select files and folders to add to bootable media

Boot media label: Boot media

Please select files or folders to add to the root folder of the Boot Media.

⊟ **Custom files and folders** (3)
Add files and folders
C:\Windows\Camera\Camera.exe   Remove
C:\Windows\HelpPane.exe   Remove
E:\27.05.2014\win64.zip   Remove

12. Inject additional drivers for specific storage controllers, network cards, or other devices. First click on the required link.

Select device drivers for the recovery environment

Please select INF files for device drivers:

- ☐ **Storage device drivers** (0)

  Add storage device drivers

- ☐ **Network device drivers** (0)

  Add network device drivers

In the opened dialog browse for an .INF file of the required driver package located on a floppy disk, local disk, CD/DVD or a network share.

Look in: Local Disk (C:)

Name	Size	Date
⊞ Program Files		5/27/2014 6:05:27 AM
⊞ Program Files (x86)		11/12/2013 4:06:08 AM
⊟ Users		9/3/2013 1:57:44 PM
⊟ Administrator		9/3/2013 1:58:00 PM
⊞ Contacts		9/3/2013 1:58:00 PM
⊟ Desktop		5/27/2014 11:56:04 PM
⊞ ADK		9/19/2013 4:41:28 AM
oemsetup.inf	22.3 KB	10/15/2008 7:04:43 PM
vmaudio.inf	4.2 KB	10/15/2008 7:04:43 PM
vmmouse.inf	1.2 KB	10/15/2008 7:04:43 PM
vmscsi.inf	1.5 KB	10/15/2008 7:04:43 PM
vmxnet.inf	3.2 KB	10/15/2008 7:04:43 PM
⊞ Documents		5/27/2014 6:11:20 AM
⊞ Downloads		9/3/2013 1:58:00 PM
⊞ Favorites		9/3/2013 1:58:00 PM
⊞ Links		9/3/2013 1:58:01 PM
⊞ Music		9/3/2013 1:58:00 PM
⊞ Pictures		9/3/2013 1:58:00 PM
⊞ Saved Games		9/3/2013 1:58:00 PM
⊞ Searches		9/3/2013 1:58:17 PM

File name: vmscsi.inf

Files of type: INF files

If successfully injected, you can see the specified driver on the list. If you'd like to add another driver, please repeat the procedure.
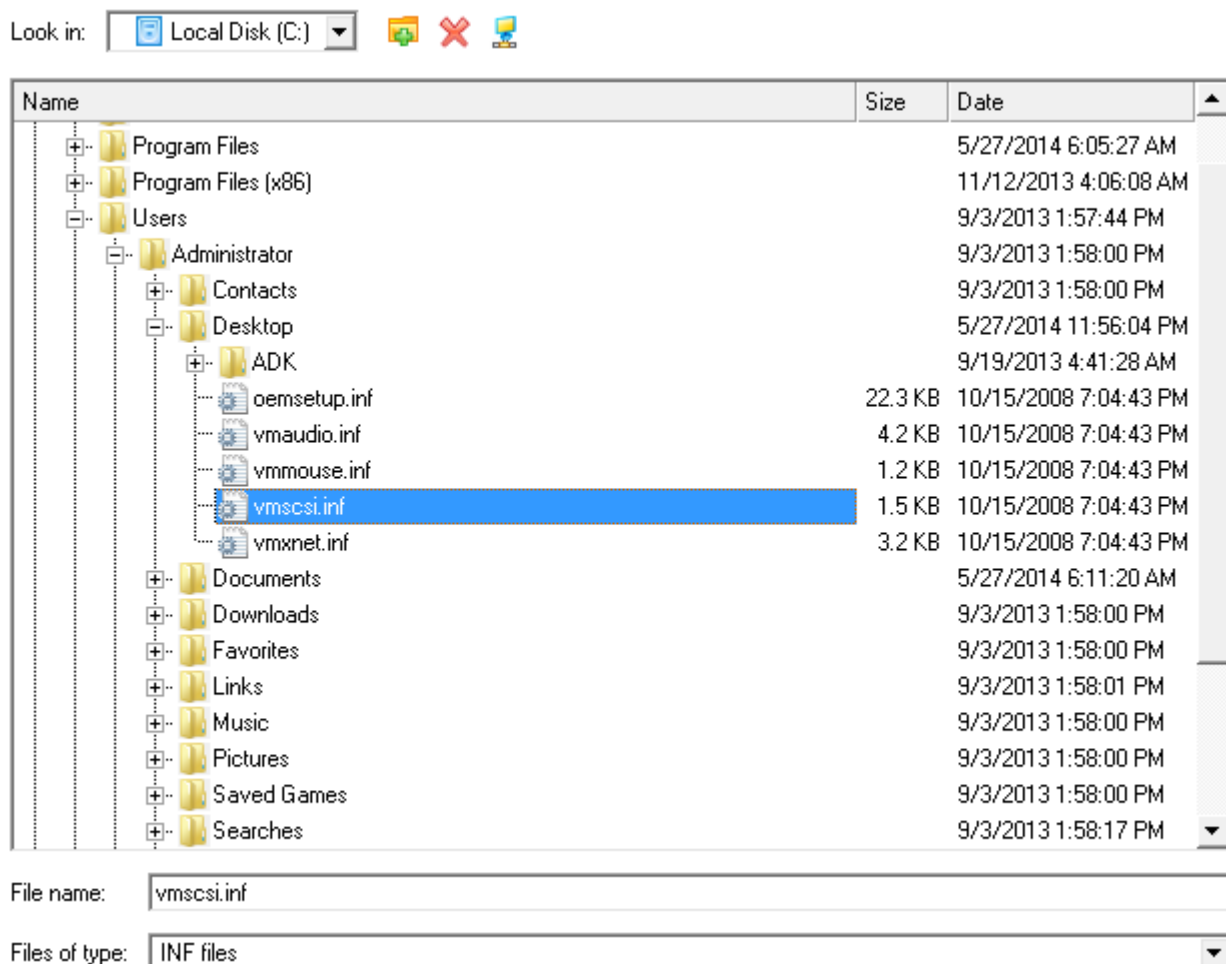
Select device drivers for the recovery environment

Please select INF files for device drivers:

☐ **Storage device drivers** (1)

Add storage device drivers

C:\Users\Administrator\Desktop\vmscsi.inf Remove

☐ **Network device drivers** (1)

Add network device drivers

C:\Users\Administrator\Desktop\vmxnet.inf Remove

Recovery Media Builder can build 32-bit WinPE media configured to the uEFI mode, which is the only type compatible with Windows pads running on Intel Atom.

By default, WinPE environment doesn't support touch screens, thus Windows pads can only be managed by mouse and/or keyboard. You can add required drivers however through our driver injector.

---

13. Set up a network connection if needed. You've got several options to choose from:

Network configuration

◉ Connect to network automatically after the startup

Network adapter to use: |1 ▲▼

  ◉ Obtain an IP address from a DHCP server

  ○ Specify an address

  IP address: [. . .]

  Subnet mask: [. . .]

  DNS address: [. . .]

○ Connect to network manually after the startup

○ Skip network adjustment

▪ **Connect to network automatically**... Specify the following parameters if you'd like to have an active network connection once the bootable environment has been started up:

  - **A network adapter to use**. Select a network adapter (if several in the system) to be used for the network connection.

  - **IP address settings.** Choose whether to get an IP address automatically from a DHCP server or set it manually.

- **Connect to network manually**... If selecting this option you will be prompted to configure network properties each time the computer has been started up from the bootable media.

- **Skip network adjustment**. Please use this option if you don't need network support on the bootable media.

14. Map a network share if needed (not be available if selecting **Skip network adjustment** on the previous step). You've got several options to choose from:

Mount a network share

⊙ Mount a network share automatically after boot

Share:	\\server\share	Browse...
Login:	xxxxxxxx	
Password:	*********	

○ Mount a network share manually after boot

○ Don't mount a network share

- **Mount a network share automatically**... Mark this option if you'd like to have a mapped network resource once the computer has been started up from the bootable media. Manually type in a path to the required network share or click **Browse** to find it, then provide user credentials if necessary.

With no pre-defined user credentials your network share will be attempted to map under the Guest account.

Please use back slashes for WinPE-based media, like \\server\share, while for Linux – forward slashes, like //server/share.

- **Mount a network share manually**... If selecting this option you will be prompted to map a network resource each time the computer has been started up from the bootable media.

- **Don't mount a network share**. Please use this option if you don't need to map network resources.

15. The wizard enables to save the current boot media configuration for future use.

Would you like to save the new configuration?

☑ Save the new configuration for future use

New configuration name: [   ]

Additional steps if using WAIK/ADK

16. If you install WAIK or ADK by their default locations, the wizard automatically detects it. Otherwise, you will need to browse for the required folder. If you haven't installed one of these tools yet, click **Download WAIK/ADK** to get them directly from the Microsoft website.

Please specify where to find WAIK/ADK

Path to installed WAIK/ADK:

C:\Program Files (x86)   Browse...

WAIK/ADK path does not seem to be valid.   Download WAIK/ADK

Please specify valid WAIK/ADK path.

Manually browsing for Windows OS kits:

Look in: Local Disk (C:)

Address: C:\Program Files (x86)\Windows Kits\8.1\

Name	Date
Local Disk (C:)	
PerfLogs	8/22/2013 8:22:35 AM
Program Files	5/27/2014 6:05:27 AM
Program Files (x86)	11/12/2013 4:06:08 AM
Common Files	8/22/2013 8:36:30 AM
Internet Explorer	8/22/2013 12:09:07 PM
Microsoft.NET	8/22/2013 8:36:30 AM
Notepad++	9/3/2013 2:04:21 PM
Windows Defender	8/22/2013 12:09:07 PM
Windows Kits	11/12/2013 4:06:08 AM
8.1	11/12/2013 4:06:08 AM
Windows Mail	8/22/2013 12:09:07 PM
Windows Media Player	8/22/2013 12:09:07 PM
Windows Multimedia Platform	8/22/2013 8:36:33 AM
Windows NT	8/22/2013 8:36:30 AM
Windows Photo Viewer	8/22/2013 12:09:07 PM
Windows Portable Devices	8/22/2013 8:36:33 AM
WindowsPowerShell	8/22/2013 8:36:30 AM
Users	9/3/2013 1:57:44 PM
Windows	5/27/2014 6:05:46 AM
DVD Drive (D:)	

The wizard won't continue until you install WAIK or ADK.

Please take the following information into account:

▪ **If running RMB under Windows 7, 8, 8.1, Server 2008 R2, Server 2012 R1/R2, please use ADK 8.1;**

▪ **If running RMB under Windows XP, Server 2003, please use WAIK of Windows Vista;**

▪ **If running RMB under Windows Vista, Server 2008 R1, please use WAIK of Windows 7**

17. When done with all parameters, click **OK** to initiate creation of the specified bootable media, which takes a couple of minutes.

Recovery media creation

Operation progress

Paragon recovery media details

Platform: Microsoft Windows PE x64

Product: Hard Disk Manager 14 Premium Edition

Destination: C:\Users\Administrator\Documents\rm_28_05_2014.iso

Building Linux Environment in an ISO image

1. Select: **Start > Programs > Deployment Manager 11™ > Paragon Recovery Media Builder™ > Recovery Media Builder**, or launch it through the Express Launcher.

2. The welcome page introduces the wizard's functionality. Besides you can see the following option here:

Welcome to the Recovery Media Builder wizard

Recovery Media Builder helps you to prepare a Linux- or WinPE-based bootable environment on a USB thumb drive or in an ISO file. This recovery environment contains a set of utilities that corresponds to the purchased product, and allows startup of your computer for maintenance or recovery purposes when OS is corrupted or cannot be used.

☐ **Use ADK/WAIK**

The wizard will use WIM image of the current operation system when creating the Recovery Environment on Windows PE platform. Select this option if you'd like to use ADK or WAIK for building Windows PE image.

- **Use ADK/WAIK**. When running under Windows 7 or later OS, Recovery Media Builder doesn't require Windows Assessment and Deployment Kit (ADK) or Automated Installation Kit (WAIK) to be installed in the system to build a WinPE-based environment, as it can directly use WIM image inside the operating system. So if having to do with Windows XP, Vista, or Server 2003 please mark this option and make sure one of the mentioned above kits is present in your system. You should also use this option, if Windows OS has been modified by the system builder as a result of which WIM image is missing. As you can see this option is relevant for Windows PE images only.

3. Select **Linux**, then the required boot mode. If you specify 'EFI' there will be created a 64-bit environment, while 'BIOS' corresponds to 32-bit.

Recovery media platform

○ Microsoft Windows PE

● Linux

　Please select firmware interface:

　● EFI

　○ BIOS

4. Specify available boot menu items for the future media by marking/unmarking checkboxes opposite item names.

Set boot media menu options

To select menu item click the checkbox next to item name:

☑ Client-driven mode
☐ Command prompt
☑ Hard disk manager
☐ Load driver
☑ Logs collector
☑ Restart computer
☑ Server-driven mode
☑ Shutdown computer
☑ Simple restore wizard

You've got the option to add custom scripts written in Paragon's Scripting Language (PSL) to be able to start them after the startup.

Set up custom scripts:

⊟ **No custom script files**

Add script file

To add a .PSL script to the media, please click the corresponding link, and then browse for the required file.

Look in: Local Disk (C:) ▼

Name	Size	Date
⊟ Local Disk (C:)		
⊞ ImageStorage		5/28/2014 3:04:56 AM
⊞ PerfLogs		8/22/2013 8:22:35 AM
⊞ Program Files		5/28/2014 3:04:56 AM
⊞ Program Files (x86)		5/28/2014 3:04:56 AM
⊞ Users		9/3/2013 1:57:44 PM
⊞ Windows		9/3/2013 11:06:59 AM
⊞ DVD Drive (D:)		

File name: [   ]

Files of type: PSL scripts ▼

If required you can define what component of the menu will be automatically selected on the expiry of a certain time limit (10 seconds by default).

5. To deploy machines in the server-driven mode, please set the following parameters:

- **Set Session ID…** Assign certain clients to the required deployment session by using the Session ID identifier (100 by default).

- **Destination hard disk**. Choose where to deploy a backup image of a separate partition/single hard disk.

Before deployment options:

- **Clear the hard disk before deployment** to make sure there is no data on it, thus avoiding any possible troubles.

- **Assign PSL script to execute…** Browse for a .PSL script file you'd like to be automatically executed before the deployment (can be certain drive partitioning operations to accomplish on client machines).

After deployment options:

- **Hide partitions after deployment**. Mark the option if you'd like partitions to be hidden on client machines after deployment.

- **Do UEFI NVRAM fix-up**. Mark the option to make a 64-bit Windows OS configured to the uEFI boot mode to successfully start up on client machines after deployment.

6. To deploy machines in the client-driven mode, please set the following additional parameters:

Set client-driven mode options

☑ Specify Infrastructure server

    ⦿ By name: `7-64-Ultimate`

    ◯ By IP address: `.   .   .`

☑ Specify image to deploy from the image storage:

`arc_xp\arc_xp.PBF`

Destination hard disk: `0` ⬍

- **Specify Infrastructure Server**. You should set a name or IP address of the required Infrastructure Server. In case the Infrastructure Server has not been set in this section, the program will automatically offer to do it after the Deployment Wizard is launched.

- **Specify image to deploy from the Image Storage**. Set a path to a backup image created in Hard Disk Manager that you'd like to deploy to client machines. In case the image has not been specified in this section, the program will automatically offer to do it after the Deployment Wizard is launched.

- **Destination hard disk**. You can set a hard disk to deploy a backup image to (if there are several on client machines). This parameter will not be taken into account if a backup image contains more than one hard disk.

7. Click on **ISO image**. If you'd like to create a PXE image or a thumb drive with the Linux environment on-board, please use the corresponding option.

Recovery media format

⦿ ISO image

    Please specify image file location:

    `C:\Users\Administrator\Documents\rm_28_05_2014.iso`   [Browse...]

◯ Removable flash media

    Please select USB-flash drive:

    USB Drive 4, Kingston DataTraveler 2.0 (3.6 GB)

◯ PXE image

> **When specifying 'PXE image' as the desired format, the 64-bit version of Recovery Media Builder will prepare two configurations to start up client machines either in the uEFI or BIOS mode. You need to specify the correct configuration in the PXE dialog. There's no way to start up both uEFI and BIOS compatible machines via one PXE session.**

8. Set a label and add additional files to the root of the bootable media by clicking the corresponding link and browsing for required files. All injected files will be listed on this page.

Select files and folders to add to bootable media

Boot media label: |

Please select files or folders to add to the root folder of the Boot Media.

⊟ **No custom files and folders**

Add files and folders

Look in: Local Disk (C:) ▼

Name	Size	Date
⊟ 🖫 Local Disk (C:)		
⊞ 📁 ImageStorage		5/28/2014 3:04:56 AM
⊞ 📁 PerfLogs		8/22/2013 8:22:35 AM
⊞ 📁 Program Files		5/28/2014 3:04:56 AM
⊞ 📁 Program Files (x86)		5/28/2014 3:04:56 AM
⊞ 📁 Users		9/3/2013 1:57:44 PM
⊞ 📁 Windows		9/3/2013 11:06:59 AM
⊞ 💿 DVD Drive (D:)		
⊞ 🖴 RecoveryMedia (E:)		

File name: [   ]

Files of type: All files ▼

Select files and folders to add to bootable media

Boot media label: Boot media

Please select files or folders to add to the root folder of the Boot Media.

⊟ **Custom files and folders** (3)

Add files and folders

C:\Windows\Camera\Camera.exe   Remove
C:\Windows\HelpPane.exe   Remove
E:\27.05.2014\win64.zip   Remove

9. Set up a network connection if needed. You've got several options to choose from:

Network configuration

- Connect to network automatically after the startup
  - Network adapter to use: 1
    - Obtain an IP address from a DHCP server
    - Specify an address
  - IP address:
  - Subnet mask:
  - DNS address:
- Connect to network manually after the startup
- Skip network adjustment

- **Connect to network automatically**... Specify the following parameters if you'd like to have an active network connection once the bootable environment has been started up:

  - **A network adapter to use**. Select a network adapter (if several in the system) to be used for the network connection.

  - **IP address settings.** Choose whether to get an IP address automatically from a DHCP server or set it manually.

- **Connect to network manually**... If selecting this option you will be prompted to configure network properties each time the computer has been started up from the bootable media.

- **Skip network adjustment**. Please use this option if you don't need network support on the bootable media.

10. Map a network share if needed (not be available if selecting **Skip network adjustment** on the previous step). You've got several options to choose from:

Mount a network share

- Mount a network share automatically after boot
  - Share: \\server\share   Browse...
  - Login: xxxxxxxx
  - Password: *********
- Mount a network share manually after boot
- Don't mount a network share

- **Mount a network share automatically**... Mark this option if you'd like to have a mapped network resource once the computer has been started up from the bootable media. Manually type in a path to the required network share or click **Browse** to find it, then provide user credentials if necessary.

With no pre-defined user credentials your network share will be attempted to map under the Guest account.

Please use back slashes for WinPE-based media, like \\server\share, while for Linux –

---

forward slashes, like //server/share.

- **Mount a network share manually**... If selecting this option you will be prompted to map a network resource each time the computer has been started up from the bootable media.
- **Don't mount a network share**. Please use this option if you don't need to map network resources.

11. The wizard enables to save the current boot media configuration for future use.

Would you like to save the new configuration?

☑ Save the new configuration for future use

New configuration name: [ ]

12. When done with all parameters, click **OK** to initiate creation of the specified bootable media, which takes a couple of minutes.

Recovery media creation

Operation progress

▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

Customizing...

Paragon recovery media details

Platform: Linux x64

Product: Hard Disk Manager 14 Premium Edition

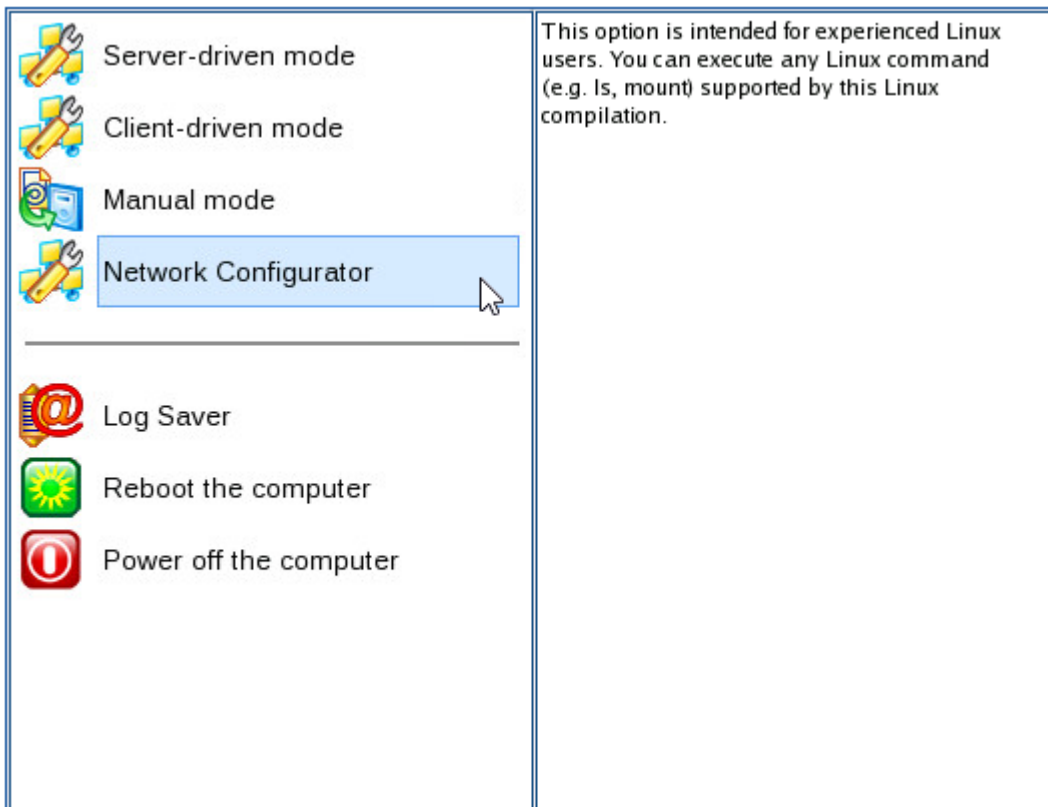Destination: USB Drive 4, JetFlash Transcend 4GB (3.7 GB)

> **ⓘ** **If you're experiencing problems with our product, please consult Deployment Manager Troubleshooting Guide.**

Working with Linux Target Module

After the client computer has been booted you can see a convenient startup menu with the list of available operations on the left and a short description of the selected item on the right.

This option is intended for experienced Linux users. You can execute any Linux command (e.g. ls, mount) supported by this Linux compilation.

- **Server-driven mode** to initiate the deployment client and join an existing session

- **Client-driven mode** to launch the deployment wizard and specify operation parameters

- **Network Configurator** to work with shared resources of the LAN (e.g. copy files or backup images to recover a corrupted system)

- **Hard Disk Manager** to create/restore backup images or carry out partitioning operations, etc. (to know more about the program, please consult documentation that comes with it)

- **Simple Restore Wizard** to easily get the system back on track

- **Log Saver** to tackle problems with handling the program by compressing logs to send to the Paragon Support Team
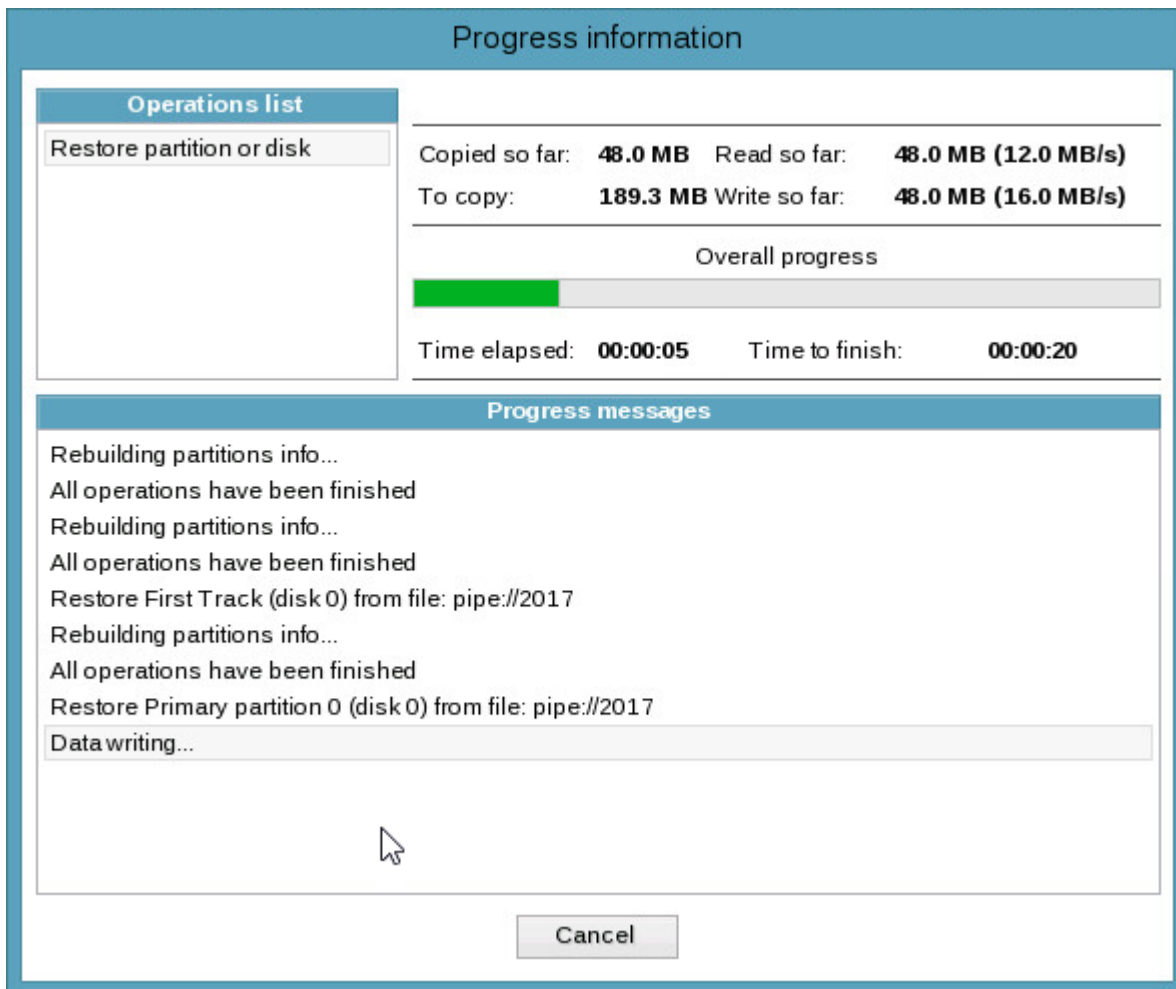

The startup menu contents of the bootable media can be customized.

By default the client computer will be automatically initiated after a 10 second idle period.

Server-driven mode

After launching the Server-driven mode you can see a well informative statistics window where it is possible to monitor real-time all operations executed at the moment.

In this mode the client will automatically join a session depending on parameters of the used target boot media. If no session ID was specified during the boot media creation, the client will join any existing automatic-mode session. Otherwise it will join a session with the same session ID.

Client-driven mode

After launching the Client-driven mode you will need to specify the following deployment parameters:

- **Infrastructure Server.** The server can be defined either by name or IP address.

- **Deployment Source.** Depending on the chosen option different algorithms of joining/creating a session will be used:

  - **Connect to the current session.** Set a session ID or browse for an appropriate session if you want to join a session that has already been started. Please note that if you enter a session ID manually and no session with this ID is found, the deployment client will stay idle until you cancel it or create an appropriate session from the Deployment Console.

  - **Define image for the deployment**. Select the option if you want to create a new session or need to specify the destination HDD and partition for deployment.

If you set the same image name and destination parameters for more than one target module, the same session will be used for deployment.

Mark the **Show the additional page…** option if you need to specify the destination HDD and partition, then press **Next**.

- **Destination hard disk.** Specify where to deploy a backup image of a separate partition/single hard disk. Please note that this parameter will not be taken into account if the backup image contains two or more hard disks.

- **Destination partition.** You can choose a partition number and type, if an image of a single partition is deployed. Please note that this parameter will not be taken into account if the backup image contains two or more partitions.

Click **Start Session** to initiate the deployment procedure and open the statistics window to monitor real-time all operations executed at the moment.

With Recovery Media Builder you can set the mentioned above parameters at the point of creating bootable media thus saving yourself from the need of doing it every time the client-driven mode is launched.

Working with WinPE Target Module

After the client computer has been booted you can see a convenient startup menu with the list of available operations. As you can see it includes the same set of operations as the Linux Target Module, but with a slightly different interface. To know more on the subject, please consult the Working with Linux Target Module chapter.

Setting up Paragon PXE Server

The Paragon PXE Server is a component of the Deployment Manager package that enables to remotely boot a computer with no operating system installed. This procedure implies that a networked client PC is able to enter a network, acquire a network address from the DHCP server and subsequently download from the TFTP server a NBP (Network Bootstrap Program) to set itself up, thus saving from the need of bootable media.

Paragon PXE Server works as a service in the system. To make the process of its configuration and management easy and understandable there is a convenient dialog that can be launched by selecting: **Start > Programs > Deployment Manager 11™ > PXE Server™ > PXE Server Settings**, or through the corresponding option of the Express Launcher.
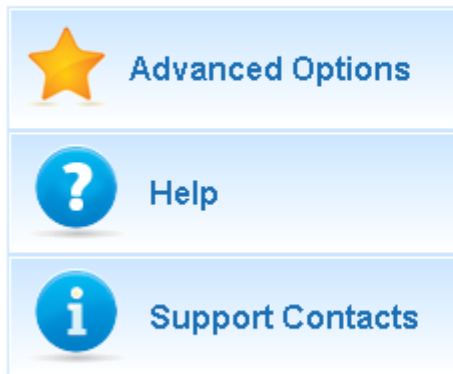
Depending on whether you decided to use the Paragon's DHCP server or not (defined during the installation) the dialog enables to set the following parameters:

- Start IP address
- Number of available IP addresses
- Subnet Mask

- A PXE image used to remotely boot client machines

For a successful startup of 64-bit client machines per PXE, the selected PXE image should correspond to the boot mode of client machines (either uEFI or BIOS):

- **"winpe.cfg"/"initrd64.cfg"/"linux64.cfg" – for legacy (BIOS) boot mode;**

- **"efipe.cfg"/"initrdefi.cfg"/"linuxefi.cfg" – for EFI boot mode.**

There's no way to start up both uEFI and BIOS compatible machines via one PXE session.
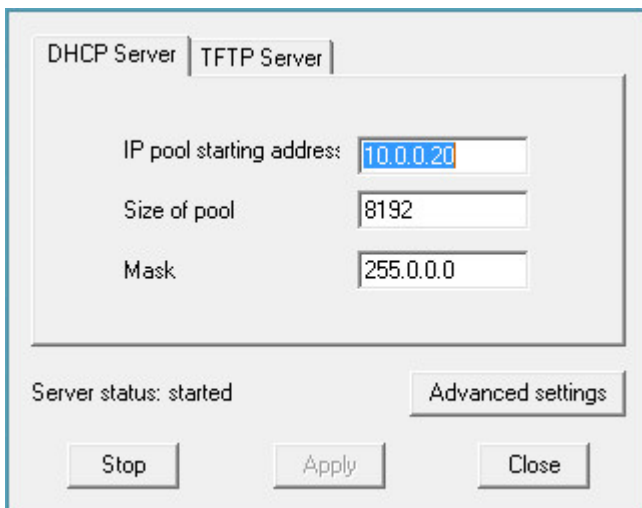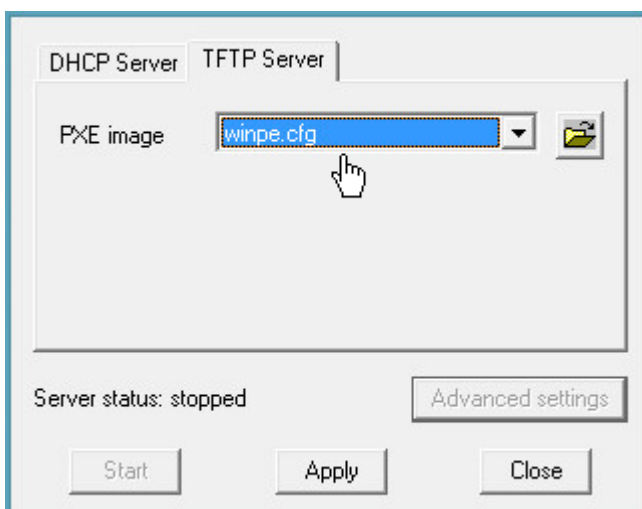
You can start/stop Paragon PXE Server by clicking the appropriate button. Please note that if you click the **Apply** button when the service is active, it will lead to its restart with new parameters.

By clicking the **Advanced Settings** button you can modify a number of additional parameters as well as see some operation statistics.

Client computers must have PXE support in order to use the PXE Server. To know more about PXE, please consult the Glossary chapter.

If you're experiencing problems with our product, please consult Deployment Manager Troubleshooting Guide.

Configuring DHCP Server for Deployment Purposes by the Example of Windows Server 2003

To set up the DHCP Server for the deployment purposes, please do the following:

1. **Run the DHCP management console.** There are several ways to do that:

   - Select **Start > Run…**, then execute the "DHCPMGMT.MSC /S" command;

   - **Start > Settings > Control Panel > Administrative tools > DHCP**.
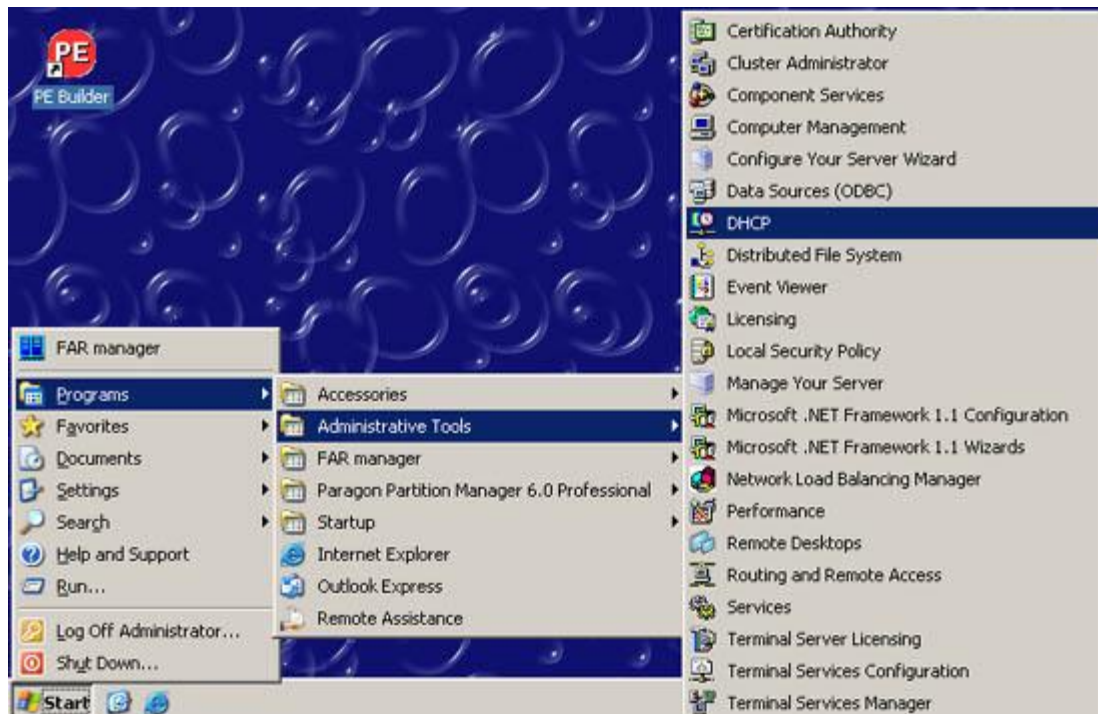
The DHCP management console will be launched:
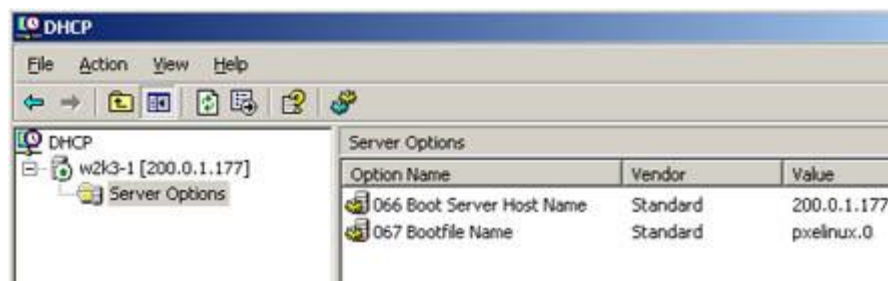
2. **Set up your DHCP server correctly.** Windows Server 2003 provides a bunch of services and settings for the DHCP service. You are to set up the global settings of the DHCP server:

There are two DHCP options that need customization that is **Option 066 - Boot Server Host Name** and **Option 067 - Bootfile Name**.

- Select the **Server Options** item in the DHCP management console and click the **Server Options** item;

- In the **Server Options** dialog, click the **Advanced** tab;

- Select the **DHCP Standard Options** vendor class;

- Select the **Default BOOTP Class** user class;

- Find the **Option 066** named **Boot Server Host Name:**
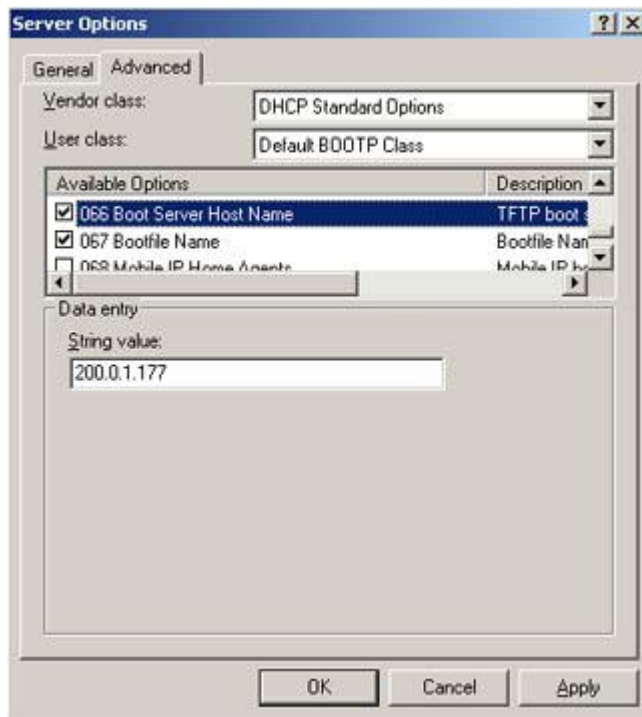
- Mark the **Option 066**;
- Enter an IP address or a network name of a <u>TFTP server</u> that is used for dispatching PXE bootable images.

In case the TFTP and DHCP servers run on the same computer, enter the computer network name or its IP address as it seen from the other computer of your LAN.

Do not use the Localhost alias or its IP equivalent 127.0.0.1.

- Find the **Option 067** named **Bootfile Name**:
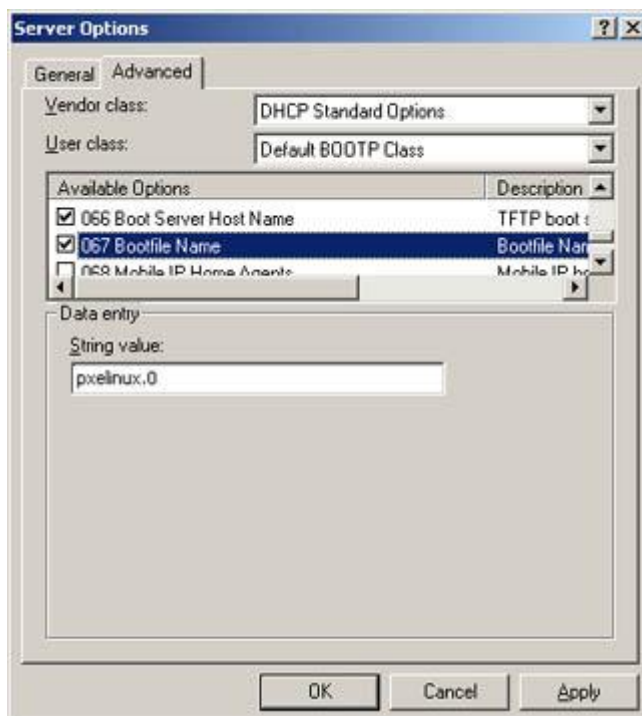
- Mark the **Option 067**;
- Specify a relative path to a bootable image and its file name to boot remote computers from.

The specified path should exist and be configured on the TFTP server.

Infrastructure Server Functionality

The Paragon Infrastructure Server is a component of the Deployment Manager package that provides all facilities needed to initiate and control the deployment procedure. It works as a service in the system. You can start/stop this service by selecting: **Start > Programs > Deployment Manager 11™ > Infrastructure Server™ > Start/Stop Infrastructure Server**, or through the corresponding options of the Express Launcher.

Partially the Infrastructure Server is being set up during the installation. However a thorough setup can only be accomplished through its configuration file. By default, you can find it here:

C:\ProgramData\mcsrv\config\coord.cfg (or **C:\Documents and Settings\All Users\Application Data\mcsrv\config\coord.cfg** for Windows XP/Server 2003 and earlier versions)

> **[ServerSettings]**
>
> **PACKINTERVAL=2**
>
> **PACKTIME=1:00:00**
>
> **IMAGEBOOT=C:\ImageStorage**

- **PACKINTERVAL**. The program keeps gathering data on the carried out deployment operations and places it in a special database. As time goes by the database starts containing plenty of outdated information, thus considerably increasing in size. To avoid it, you can choose how often it should be compressed by entering the required period of time in days

> **In case the interval is not set, the database will be compressed daily.**

- **PACKTIME** to set the exact time (in the HH:MM:SS format) of the database compression

> ℹ️ **In case the time is not set or some impossible value is used, the database will not be compressed at all.**

- **IMAGEBOOT** to define default location of backup images
- **LOGPATH** to set where to place logs of the Infrastructure Server.

> ℹ️ **In case it is not set, the program will use the Infrastructure Server directory.**

You can also change the transfer parameters by editing **mcast.ini** file (if not created earlier it should be placed near **coord.cfg)**:

- **BASEID** to define the offset from the multicast base IP address (224.1.1.1). The default value is 1, available range: 1…224
- **TCP_ANSWER_TIMEOUT** to set TCP request latency in milliseconds. The default value is 10000, available range: 1000…10000
- **TRAFFIC_TIMEOUT** to define an interval between packet transmissions (in milliseconds). It can help to decrease the traffic load on the network. The default value is 0, available range: 0…5000
- **MULTICAST_TTL** to define the maximum number of routers between the server and targets minus 1.The default value is 1; available range: 1…255
- **ENABLE_FLOW_CTRL** to allow the packet transfer rate control. The default value is 1, available values: 0 (disabled), 1 (enabled)
- **SET_SMALL_BUFFER** to allow the smallest packet size. Smaller data blocks decrease the transfer rate but increase its reliability. The default value is 0, available values: 0 (disabled), 1 (enabled).

> ℹ️ **Please use small buffer size when deploying in a virtual environment like VMware.**

- **WAKEUP_COUNT** to define a number of computers that can be turned on through Wake-on-LAN at a time. The default value is 4, available range: 1…50
- **WAKEUP_TIMEOUT** to define an interval between computer groups to be turned on through Wake-on-LAN (in seconds). The default value is 10, available range: 1…120

License Control

Especially for evaluation purposes, you've got the option to try Paragon Deployment Manager under the terms of our evaluation license. It enables to use the product for 60 days and deploy no more than 100 machines (however each unit can be deployed unrestrictedly during the trial period).

On purchasing the product you will be provided with a commercial license with no time limit and a new total license quota depending on your needs.

To add a new license, please do the following:

- Open the Deployment Console;

- Select **Help > About** in the main menu;

- In the opened dialog press **Add License** and select a new license file.
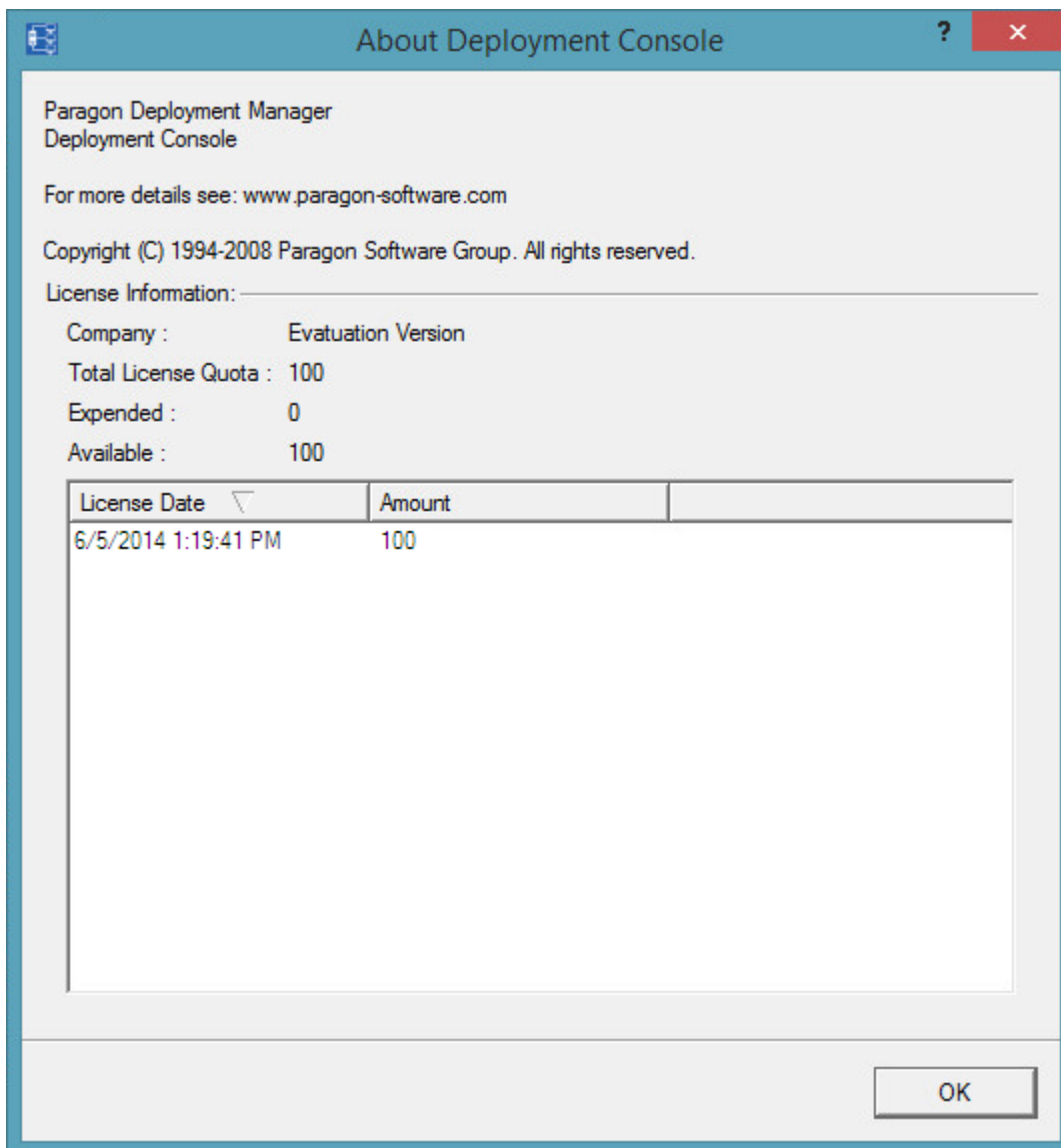
After confirmation, the new license will be passed over to the Infrastructure Server.

> **Replacing the evaluation license file with a commercial one will set the Total License Quota equal to the commercial license quota. Adding one more commercial license however, will make the total quota be increased correspondingly.**

You can always learn about the Total/Expended/Available License Quota in the About dialog.

Typical Scenarios of System Deployment

This chapter lists various scenarios of the system deployment that may be accomplished with Paragon Deployment Manager. You can find here useful recommendations and descriptions of operations.

Automatic Cyclic Deployment with PXE Environment

This scenario is an ideal solution when you have to deal with the problem of deploying a bunch of identical computers on a regular basis in the automatic mode. The program provides the possibility to start up clients by using the PXE facilities and then deploy them automatically.

To launch the operation you should take the following steps:

1. Set up a Windows based Master computer by using the Microsoft Sysprep utility;

2. Create a Master image with Paragon Hard Disk Manager;

To know more about Paragon Hard Disk Manager, please consult its documentation.

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3. Build a PXE-based image with Recovery Media Builder;

4. Configure Paragon PXE Server;

5. Open the Deployment Console;

6. Launch the New Deployment Session wizard to create an automatic deployment session. You should define:

   - A session name

   - An image file to deploy

   - Automatic session type

   - Total number of clients to deploy

   - Allowable number of clients to successfully deploy in order to finish the session (percentage)

   - Time limit by exceeding which the lagging behind clients may be excluded from the session

   - Post-Config options (the **sysprep.inf** file may be updated without rebuilding the master image)

   - Cyclic type in the scheduler providing one and the same session to be automatically repeated after connecting new clients. Thus there is no need to launch the session manually each time new clients are connected

7. Connect computers and launch them from the Network;

8. The deployment procedure will be automatically launched.

Automatic Cyclic Deployment with Bootable Media without Session ID Key

There can be situations when the PXE facilities are not that preferable to deploy PCs or available network cards have no support of booting from the LAN. In this case you can employ this very scenario. It is practically the same as the previous one. The only difference is that for launching the client module is used bootable media instead of the PXE environment. The Session ID is not taken into account here since computers are identical and there is no need to identify various deployment sessions, otherwise please consult the Automatic Cyclic Deployment with Bootable Media with Session ID Key chapter for more information.

Automatic Multisession Cyclic Deployment with Bootable Media with Session ID Key

To deploy several computers of different hardware at the same time it is required to use different Master images hence different sessions. Each session provides its own ID and certain target computers are booted from the bootable media containing particular ID. Thus clients are assigned automatically after checking the Session ID.

To launch the operation you should take the following steps:

1. Set up Windows based Master computers for each particular computer(s) by using the Microsoft Sysprep utility;

2. Create Master images with Paragon Hard Disk Manager;

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i   **To know more about Paragon Hard Disk Manager, please consult its documentation.**

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3. Prepare flash-based bootable media with different Session ID for each particular computer(s);

4. Open the Deployment Console;

5. Create deployment templates for each particular computer(s). You should define:

   - A session name

   - An image file to deploy

   - A Session ID

   - Total number of clients to deploy

   - Allowable number of clients to successfully deploy in order to finish the session (percentage)

   - Time limit by exceeding which the lagging behind clients may be excluded from the session

   - Post-Config options (the **sysprep.inf** file may be updated without rebuilding the master image)

   - Cyclic type in the scheduler providing one and the same session to be automatically repeated after connecting new clients. Thus there is no need to launch the session manually each time new clients are connected

6. Boot computers from the required bootable media to automatically launch the deployment procedure.

Deployment with MAC Address as an Identifier for a Particular Session

(Machines are booted either from network or bootable media)

It is a common practice for big companies when system administrators have to deal with restoring particular computers on a regular basis. In this case the deployment procedure can be launched manually or scheduled. If a list of the required MAC addresses is available, it is possible to use just one PXE Server for computers of different hardware in that way saving from creation of different bootable media for each particular computer. To boot from the LAN the Wake-up on LAN feature can be used.

To launch the operation you should take the following steps:

1. Set up Windows based Master computers for each particular computer(s) by using the Microsoft Sysprep utility;

2. Create Master images with Paragon Hard Disk Manager;

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i   **To know more about Paragon Hard Disk Manager, please consult its documentation.**

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3. Prepare flash-based bootable media with different Session ID for each particular computer(s) or configure Paragon PXE Server;

4. Create deployment templates for each particular computer(s). You should define:

   - A session name

   - Computers to deploy. Either import a list of MAC addresses or manual select required targets from available on the net

   - An image file to deploy

   - Total number of clients to deploy

   - Allowable number of clients to successfully deploy in order to finish the session (percentage)

   - Time limit by exceeding which the lagging behind clients may be excluded from the session

   - Post-Config options (the **sysprep.inf** file may be updated without rebuilding the master image)

5. Boot computers from the LAN or the required bootable media. PCs can be automatically rebooted from the Windows in case additional Windows agents are installed. Wake-up on LAN feature can also be used.

6. Schedule the operation or launch it manually.

Classical Client-driven Deployment without Central Control when Client Initiates the Deployment

(The client is started either from the bootable media or through the PXE environment)

To get maximum flexibility the program provides the possibility to initiate deployment sessions from the client's side, thus bypassing the central console management. At first sight this particular scenario might look like a simple restore procedure from the network-shared folder. But that is not exactly so. In this case the client does not access images directly but with the help of the Infrastructure Server facilities.

To launch the operation you should take the following steps:

1. Configure the Infrastructure Server properly (during the installation procedure or by using its configuration file) to use a specific directory as Image Storage;

2. Create a Master image with Paragon Hard Disk Manager and place it into the Image Storage;

To know more about Paragon Hard Disk Manager, please consult its documentation.

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3. Start up the client computer by using the Paragon PXE Server or create a bootable flash card with Recovery Media Builder;

4. Initiate the Client-driven mode;

5. Define the required Infrastructure Server and image to deploy;

With Recovery Media Builder you can set the mentioned above parameters at the point of creating bootable media thus saving yourself from the need of doing it every time the client-driven mode is launched.

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6. Click the Finish button to initiate the deployment procedure and launch the statistics window where it is possible to monitor real-time all operations executed at the moment.

If you set the same image name and destination parameters for more than one target module, the same session will be used for deployment.

Glossary

Unicast

Unicast is the term used to describe communication where a piece of information is sent from one point to another point. In this case there is just one sender, and one receiver.

Unicast transmission, in which a packet is sent from a single source to a specified destination, is still the predominant form of transmission on LANs and within the Internet. All LANs (e.g. Ethernet) and IP networks support the unicast transfer mode, and most users are familiar with the standard unicast applications (e.g. http, smtp, ftp and telnet), which employ the TCP transport protocol.

Multicast

Multicast is the delivery of information to a group of destinations simultaneously using the most efficient strategy to deliver the messages over each link of the network only once and only create copies when the links to the destinations split.

The word "Multicast" is typically used to refer to IP Multicast, the implementation of the multicast concept on the IP routing level, where routers create optimal spanning tree distribution paths for datagrams sent to a multicast destination address in realtime. But there are also other implementations of the multicast distribution strategy such as system deployment, etc.

Broadcast

In computer networking, broadcasting refers to transmitting a packet that will be received (conceptionally) by every device on the network. In practice, the scope of the broadcast is limited to a broadcast domain.

Broadcast transmission is supported on most LANs (e.g. Ethernet), and may be used to send the same message to all computers on the LAN (e.g. the address resolution protocol (arp) uses this to send an address resolution query to all computers on a LAN). Network layer protocols (such as IP) also support a form of broadcast which allows the same packet to be sent to every system in a logical network.

PXE (Preboot Execution Environment)

The advent of the Preboot Execution Environment PXE) has provided Altiris with the mechanism to rationalise the cost of installing a new operating system down to an acceptable level. It has enabled the use of Rapid Deploy (a component part of the Altiris eXpress Server which is used to remotely deploy images) over the network by allowing a computer, which has no working operating system to remotely boot from the network without any manual intervention at the machine by an engineer or user.

In short, by employing the abilities referred to above, a client PC should be able to enter a network, acquire a network address from the DHCP server and subsequently download a NBP (Network Bootstrap Program) to set itself up.

UDP compared to TCP

TCP cannot be used effectively for multicasting since the TCP protocol is designed for reliable communications between two end points, not between a group of client computers and a server. There are no multicasting protocols that use TCP. UDP is fast and enables to stream the data: That is, it is not required to wait for an acknowledgment before sending the next packet.

Sysprep (System Preparation)

The Microsoft Sysprep is a handy tool specially designed for system administrators, OEM (Original Equipment Manufacturers) System Builders, etc. to automatically deploy Windows based operating systems on multiple computers. With Sysprep you can easily remove all the unique information from a Master PC (used as a sample computer) in order to make it ready to deploy its image to many other computers of different hardware configuration. Besides it enables to automatically set up additional configuration options (workgroup, domain, organization name, PC name, default display size, etc.).

All the Sysprep configuration information is kept in one simple **.inf file**.

To know more about Microsoft Sysprep functionality, please consult documentation that comes with the utility.

Wake-up on LAN

Wake-up on LAN is a technology that enables a network administrator to remotely power on a computer or to wake it up from the sleep mode, thus saving from the need to physically visit each computer on the network. Wake-up on LAN works by sending a wake-up frame or packet to a client machine from a server machine that has remote network management software installed. The Wake-up on LAN network adapter installed in the client receives the wake-up frame and turns on. The scheduled tasks then begin.

To use Wake-up on LAN you need a network adapter, motherboard, and remote management software compatible with that technology.

ISO File

An ISO file contains the complete image of a CD/DVD disc in the ISO 9660 file system. That means that besides data files it includes all the file system metadata (bootstrap code and attributes). These properties make it an attractive alternative to physical media for the distribution of software over the Internet.

DHCP Server

DHCP (Dynamic Host Configuration Protocol) is a protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network. In some systems, the device's IP address can even change while it is still connected. DHCP also supports a mix of static and dynamic IP addresses.

TFTP Server

TFTP (Trivial File Transfer Protocol) is a simple form of the FTP (File Transfer Protocol). TFTP uses the User Datagram Protocol (UDP) and provides no security features. It is often used by servers to boot diskless workstations, X-terminals and routers.